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TRANSACTIONS

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AMERICAN ENTOMOLOGICAL SOCIETY.

VOLUME XVI.

Revision of the species of CARDIOPHORUS Esch. of America North of Mexico.

FREDERICK BLANCHARD.

In the following attempt to define our species of *Cardiophorus* it has been the aim to indicate as correctly as possible whatever is observable in the material at hand. The series examined has not been so full in some respects as is desirable, and no doubt further specimens and more experience may modify some of the conclusions here adopted.

All our species have simple claws, but they may be separated into two quite distinct series according to certain differences seen in the prothorax. In the first division, including about one-third of our species, the hind angles of the pronotum are either short or obliquely truncate; beneath, the hind margin of the side pieces is either straight, or at most sinuate inside of the angles, and the submarginal suture is cariniform in its entire length when the hind angles of the pronotum are not truncate; but when the angles are truncate above the suture is slightly open at base and the margin of the flanks is a little more prominent than the margin of the pronotum, the margins becoming connate shortly before the base and the suture cariniform as before. The suture is straight or feebly sinuate. Accompa-

nying these peculiarities of form it will be observed that the margin of the front of the head is divided near the eyes. None of these species, except *cardisce*, are known from east of the Mississippi. In a cursory examination of Candèze, "Elaterides" v. iii, various allusions, in different descriptions, to the prothorax having the hind angles short or truncate, and the submarginal suture cariniform, indicate that the characters above mentioned are not peculiar to our species. The European species *C. musculus*, of which specimens are before me, is a case in point. Here the hind angles are short, but not truncate above, the submarginal suture is strongly cariniform, visible at base from above and confluent with the carina of the hind angle; the hind margin of the flanks is entire, and the frontal margin divided near the eyes. The European *exaratus*, which is also before me, to which our *cardisce* is compared by Candèze, belongs to the next division, the apparent resemblance not being of real importance.

In the second division the hind angles of the prothorax are produced behind and carinate with one exception. The submarginal sutures are usually present, impressed and broadly sinuate, rarely, somewhat cariniform anteriorly. In one species they are quite absent. The hind margin of the flanks next to the angles is strongly rectangularly indentate making the base broadly lobed inside the emargination. The frontal margin of the head is entire. A few European species, both with simple and with toothed claws, have been examined and found to be of the present form.

Our species are all normally clothed with more or less abundant prostrate pubescence, arising from fine punctures, also with suberect bristles arising from sparser, coarser punctures. The punctuation in the same species is frequently quite variable in fineness and density, and the coarser punctuation of the pronotum is not distinguishable in some specimens, while in others it may be well marked. In other species the double punctuation while constant is variable in distinctness. The double punctuation is always more evident on the metasternum, hind coxal plates and abdomen, but it may be present or not on the prothorax, above and beneath. The antennæ vary sometimes very considerably, according to the sex, being longer, and usually with the joints 3–10 broader in the middle in the ♂ than in the ♀, in which sex they are gradually wider from base to tip. They also vary from being slender and feebly serrate to stouter and strongly serrate. The last joint of the maxillary palpi usually tri-

angular, becomes exceptionally oval. The prosternal lobe is usually prominent and strongly rounded, the posterior process extending behind the coxæ is subject to considerable variation which has been largely made use of in the following tables; when fully developed the process is nearly horizontal beneath, or feebly curved upward with marginal impressed lines between the coxæ, extending forward and curving round the coxal cavities and backward to, and meeting at, the apex. The lines frequently disappear immediately behind the coxæ and the process itself may be strongly ascending beneath and abbreviated in length. The submarginal sutures of the prothorax normally reach from the basal angle to the anterior third or fourth, but in some species they are quite variable, so that their length does not afford any distinguishing character. I have, however, laid some stress upon their development in one or two instances. The mesosternal fossa presents no particular feature worthy of remark, except the one used in the second table to separate *convexus* and its allies. This difference is very obvious in these species, separating them from all the others. The hind coxal plates vary greatly, and while of much importance in the first division, in the second very little use can be made of them, one important exception, however, occurs in the case of *dispar*, which seems almost worthy of being placed as another genus. Reference is made in the present paper to three other forms. In the first the plates are narrowed externally, the hind margin extending from the trochanter obliquely forward; in the second the hind margin is transverse; in the third the plates are dilated, that is, extending outward and obliquely backward from the trochanter. The variations in the tarsi are treated in the descriptions following. The claws, while showing some slight differences in size, are, on the whole, very much alike.

The sexes frequently differ in size, the variation between the smallest males and the largest females being sometimes very great, and in studying the species it is very desirable that due attention be given to the sexes of the specimens under consideration.

If any apology is needed for the length of the descriptions given I can only plead the insufficiency of many previous ones and the desire to leave as little as possible for granted.

I am greatly indebted to Dr. Horn for suggestions and encouragement as well as for the loan of specimens. To the Cambridge Museum, to Mr. Ulke and others, I would express my acknowledgements for favors received.

Table of Species.

Basal margin of propleuræ straight or sinuate next to the outer angle: submarginal suture of prothorax straight or moderately sinuate, cariniform; frontal margin divided near the eyes ..... I.

Basal margin of propleuræ with a strong rectangular indentation next to the outer angle; frontal margin simple ..... II.

I.

Pronotum with hind angles obliquely truncate ..... 2.

Pronotum with hind angles produced ..... 7.

2.—Prosternal process long, scarcely, or but moderately ascending beneath ..... 3.

Prosternal process short, strongly ascending ..... 6.

3.—Posterior coxal plates dilated behind ..... 4.

Posterior coxal plates narrowed externally, or with the hind margin transverse ..... 5.

4.—Opaque, lead black, densely, finely punctate ..... 1. **amplicollis.**

Shining black, moderately punctulate, elytra usually four spotted, sometimes immaculate ..... 2. **fenestratus.**

5.—Prosternal process margined behind the coxæ, elytra with paler variable markings, or immaculate ..... 3. **cardisce.**

Prosternal process not margined behind, elytra bifasciate with yellow. 4. **bifasciatus.**

6.—Hind coxal plates dilated externally, elytra four spotted ..... 5. **coxalis.**

Hind coxal plates narrowed externally, elytra four spotted or subfasciate. 6. **stigmaticus.**

7.—Species distinctly, or moderately shining ..... 8.

Species distinctly opaque, hind coxal plates not dilated, prosternal process not margined ..... 10.

8.—Hind coxal plates narrowed externally; prosternal process not margined, short, moderately ascending beneath ..... 7. **pullus.**

Hind coxal plates dilated, prosternal process margined ..... 9.

9.—Prosternal process short, strongly ascending, elytra four spotted. 8. **gemmifer.**

Prosternal process long, scarcely ascending, elytra immaculate. 9. **tumidicollis.**

10.—Prosternal process long, moderately ascending, sides of prothorax beneath variolate behind ..... 10. **luridipes.**

Prosternal process short, strongly ascending, lobe broadly and feebly rounded, flanks of prothorax evenly punctulate ..... 11. **abbreviatus.**

II.

Sides of mesosternal fossa prominent and nearly vertical in front, tarsi slender, with the first joint of the middle and hind tarsi distinctly longer than the last, prosternal process with converging impressed lines reaching nearly or quite to the tip ..... 2.

Sides of mesosternal fossa not prominent, oblique in front ..... 5.

2.—Thorax dull, extremely finely and densely punctulate ..... 12. **erythropus.**

Thorax shining, moderately punctulate ..... 3.

3.—Form more slender, black, shining, thorax distinctly longer than wide, punctuation single, intercoxal lines produced in front.
13. **angustatus.**

Form stouter, piceous or testaceous. 4.

4.—Thorax longer than wide, elytra less strongly striate, intercoxal lines variable in front, color usually fuscous, or brown black, varying to dull black or testaceous, punctuation of the thorax varying from single to double. 14. **convexus.**

Thorax not longer than wide, punctuation single, intercoxal lines distinctly confluent with antecoxal lines, color rufotestaceous, prothorax above and beneath infuscate. 15. **floridæ.**

5.—Second joint of antennæ longer than wide and more than one-half as long as the third. 6.

Second joint small, one-half as long as the third. 18.

6.—Prosternal process margined behind the coxæ. 7.

Prosternal process not margined behind the coxæ. 10.

7.—Basal striæ of pronotum long. 8.

Basal striæ of pronotum short. 9.

8.—More slender and shining, prothorax punctulate with sparser coarse punctures intermixed, pubescence fine and short. 16. **longior.**

Robust, dull black, scarcely shining, punctures of prothorax coarser, pubescence longer and more conspicuous. 17. **nevadensis.**

9.—Elytra black. 18. **gagates.**

Elytra partly or wholly red, hind coxæ narrower. 19. **togatus.**

10.—Elytra partly red, tibiæ with very short and fine pubescence, spines few and distant, middle and hind tarsi with the first joint distinctly longer than the last, prosternal process scarcely elevated behind.
20. **Edwardsii.**

Elytra unicolorous, tibiæ with longer pubescence and more or less thickly spinous, the middle and hind tarsi with the first joint equal to the last or shorter than it. 11.

11.—Prosternal process usually longer, but feebly ascending behind, except as noted in *tenebrosus*. 12.

Prosternal process with lower surface strongly ascending behind. 14.

12.—Subopaque black; prothorax as wide as the elytra, densely, strongly punctulate, elytra more acute behind, intervals flat. 21. **latiusculus.**

More shining; prothorax usually narrower than the elytra and finely punctulate, elytra less acuminate behind, intervals more or less convex.

13.—Prothorax less convex, basal striæ longer. 22. **tenebrosus.**

Prothorax more convex, basal striæ shorter. 23. **convexulus.**

14.—Hind coxal plates strongly narrowed externally and broadly rounded, shining, usually feebly bronzed, pubescence moderately long, not dense.
24. **crinitus.**

Hind coxal plates moderately narrowed externally, the angles distinct and rounded. 15.

15.—Submarginal lines of prothorax short, thorax finely and rather closely punctulate, pubescence rather dense and conspicuous pale cinereous, bristles fine. 25. **pubescens.**

Submarginal lines of prothorax well developed, sculpture coarser, opaque or subopaque. 16.

16.—Distinctly opaque black, densely punctate, bristles black, antennæ of ♂ more slender ..... 26. **carbonatus.**

Subopaque, lead black or brownish, less densely and coarsely punctate, bristles brown, antennæ of ♂ with joints broader ..... 27. **obscurus.**

17.—Palpi with last joint triangular ..... 18.

Palpi with last joint narrow, oval ..... 19.

18.—Coppery or brassy bronzed, strongly finely punctate, submarginal lines of prothorax distinct, basal striæ long, prosternal process strongly ascending, not margined behind ..... 28. **æneus.**

Feebly æneous, submarginal lines of prothorax feeble, basal or obsolete, basal striæ short, prosternal process rather short, usually distinctly margined ..... 29. **robustus.**

19.—Hind coxal plates normal, submarginal lines distinct, hind angles of the prothorax with the carina very short ..... 30. **seniculus.**

Hind coxal plates strongly produced at middle, obliquely narrowed from the inner angle between the thighs, submarginal lines of the prothorax entirely absent ..... 31. **dispar.**

I

1. **C. amplicollis** Motsch. Moderately convex, lead black, opaque, clothed above with fine cinereous pubescence and short suberect bristles, directed forward on the head and basal half of the thorax, backward on the anterior part of the thorax and on the elytra. Antennæ black, serrate, about as long as the head and thorax in the ♂, a very little shorter and more slender in the ♀, second joint more than one-half as long as the third, which and the following are about equal in length; third to sixth broader, seventh to eleventh gradually more slender, the last elongate oval, constricted at tip. Head densely and strongly punctulate, and with sparser coarser punctures, frontal margin elevated and broadly rounded, and with near each end a short oblique carina directed towards the upper part of the eye. Thorax usually broader than long, densely strongly punctulate, with sparser punctures regularly intermixed, longitudinally impressed at middle, sides strongly arcuate, more narrowed in front than behind, hind angles obliquely truncate above, produced beneath, the carina not joining the submarginal line behind, the basal lobe more or less distinctly tridentate, plicæ long. Elytra feebly rounded at sides or subparallel, striæ moderately impressed, punctured; intervals slightly convex, punctulate and transversely wrinkled. Body beneath clothed with cinereous pubescence, rather closely and strongly punctulate, with the coarser punctures everywhere evident, but a little less marked on the propleuræ. Intercoxal process of prosternum long, rather narrow, acute and feebly ascending, the marginal lines reaching the apex. The submarginal lines of the prothorax are nearly straight, sharply elevated internally, or cariniform, impressed exteriorly and reaching beyond the middle, base inside the angle not, or scarcely sinuate. Hind coxal plates dilated behind outwardly with the free angle rounded. Legs black, middle and hind tarsi nearly as long as the tibiæ, slender, pubescent and spinose, the first joint of the middle and hind tarsi longer than the last, the second about equal to it, third and fourth gradually shorter; the anterior tarsi are shorter, the first joint about equal to the last, second, third and fourth gradually shorter; claws moderate. Length .26-.27 inch; 6.2-6.5 mm.

Calif.—Many specimens were obtained by Mr. Ricksecker on Willow. Collections of Horn, Ulke and LeConte. Only differs from immaculate *fenestratus* by the lead black color, the denser punctuation and opaque surface, and is possibly not distinct. In his description Motschulsky says "interstitiis distincte punctatis, fere transversim rugatis; laminis coxarum quadrato dilatato," which seems to apply best here. He also says that it is smaller than *tenebrosus*, which would forbid a reference to the species described further on as *latiusculus* Esch. to which the name *amplicollis* is more appropriate.

2. **C. fenestratus** Lec.—Form of the last, shining, black, or with the elytra four spotted, pubescence fuscous. Antennæ black, as in the last. Head and thorax finely not densely punctulate, with coarser punctures, more or less evident intermixed. Thorax convex, usually broader than long, with sides strongly rounded and narrowed before, less narrowed behind, more or less distinctly impressed at middle, basal angles obliquely truncate above, produced beneath, the carina not joining the submarginal line, plicæ long, distinct. Elytra with sides rounded, striæ punctate, intervals moderately or feebly convex, finely punctulate and sometimes wrinkled, usually with an irregular or rounded yellow spot in front of middle and another before the apex of each elytron; in one specimen the anterior spot is prolonged obliquely forward to the humerus. Body beneath moderately punctulate, the coarser punctures less evident on the sides of the prothorax; submarginal line of prothorax cariniform at base, gradually impressed towards the tip, which usually reaches the middle or the anterior third; intercoxal process of prosternum margined behind; hind coxal plates distinctly dilated behind. Legs as in the last, black. Length .23-.27 inch.; 6-7 mm.

Maculate specimens have been seen from Nebraska, Kansas, Colorado, Utah, Montana, Washington Territory, Oregon, California and Nevada; and immaculate specimens from Nebraska, Utah and British Columbia.

Two specimens from Utah, unspotted, are somewhat intermediate in punctuation between the usual form and the preceding species. In both species the base of the side pieces of the prothorax is but feebly sinuate inside the exterior angle. The sexes do not differ much in size or form.

Messrs. Hubbard and Schwarz mention this species with an interrogation in their List of Coleoptera of Michigan (Proc. Am. Phil. Soc. xvii, p. 656), but the locality seems doubtful. I have also seen specimens labeled Pennsylvania, a scarcely possible locality.

3. **C. cardisce** Say.—Very convex, narrower and more acuminate behind with a more yellowish pubescence. Antennæ black or piceous, serrate, stouter in the ♂ and longer than the head and thorax, much shorter in the ♀. Head and thorax punctulate with coarser punctures intermixed. Thorax very convex, not impressed at middle, in the ♂ sometimes a little longer than wide, sides

rounded, less narrowed behind than in front, hind angles obliquely truncate above and with the carina not reaching the submarginal line, angles produced below. Elytra punctate striate intervals feebly convex, punctulate, sides rounded, apex narrower, normally with two small pale yellow spots before the middle and two before the apex, either pair may be obsolete or wanting, the posterior are sometimes transverse and reach both margin and suture, the humeri may have a small spot, or the ante-median spot may be extended forward obliquely to the humeri. In one ♀ (Massachusetts), a vitta extends from the humerus obliquely backward and inward narrowly one-third, then is dilated inwardly for another third and then directed both ways so as to reach both margin and suture, apex black. Body beneath shining, punctulate with coarser punctures intermixed, except on the sides of the prothorax; submarginal lines reaching the middle of the thorax or beyond, cariniform at base, impressed anteriorly, exterior angle of side pieces acute, produced beyond the base of the pronotum, not sinuate at base inside the angle, post coxal process rather short, margined behind, and feebly ascending; hind coxal plates with posterior margin transverse, not dilated behind. Legs of the same form as in the previous species, black varied with yellow. Length .22–.33 inch.; 6–8 mm.

Massachusetts, Cony Island, New York, New Jersey, Georgia, Florida, Canada, Michigan, Illinois, Missouri, Nebraska.

The only Massachusetts specimen seen was found on the sea-shore, and I suspect it does not occur inland east of the great lakes. In the two preceding species there is not a notable difference in size in the sexes, but here the ♀ is frequently much larger. It differs especially from *f.-costatus* by the more elongate form, more acuminate behind, by the greater convexity of the thorax and the less dilated hind coxal plates. Candèze uses the truncation of the hind angles of the prothorax, in his synoptic table, to distinguish one of the variations of this species, but does not allude to it in the description. The type of *Dejeanii* Lec. is a ♂ of this species.

4. **C. bifasciatus** n. sp.—Black, opaque, clothed with yellowish pubescence, with two undulating yellow fasciæ across the elytra, ♀ robust, very convex, legs varied with rufous. Antennæ of the ♀ slender, feebly serrate, short, two-thirds the length of the head and thorax. Head feebly convex with frontal margin finely elevated and broadly rounded, the lateral oblique carina present, densely punctured with with fine and coarse punctures. Thorax very convex, as wide as, or wider than long, densely finely punctate and with numerous regularly disposed larger punctures distant from one another three or four times their breadth, sides strongly rounded and narrowed in front, obliquely less narrowed behind, hind angles obliquely truncate above, produced beneath, basal plicæ moderately long, lobe bisinuate, disc very faintly longitudinally impressed, carina not confluent, with submarginal line, though sometimes barely reaching it by a minute deflection. Elytra wider than the thorax, convex, sides broadly rounded and narrowed from behind the middle to tip, strongly punctate striate, intervals very convex, becoming more so towards the apex, rather densely punctulate, a median or slightly ante-median fascia extending from the suture out-

ward and backward and then forward to the margin and sometimes extending forward on the sides to the humeri and narrowly backward to the posterior fascia which reverses the direction of the anterior one extending first forward and then backward. Body beneath more shining, strongly and closely punctulate, a little more sparingly on the prosternum, more coarsely and confluently towards the base of the flanks of the prothorax, deeply, coarsely and confluently punctured on the posterior half of the fourth ventral and on the last, submarginal line of prothorax cariniform extending to middle or anterior third, postcoxal process moderately long, somewhat ascending, not margined behind; the hind coxal plates are narrowed externally, very strongly in one specimen and broadly rounded, the external angle distinct in two others and rounded. Legs with femora dark, tibiæ and tarsi more or less rufous, middle and hind tarsi with the first joint much longer than the last. Length .25–.28 inch; 6.1–7.1 mm.

California. Three females, Dr. Horn and Mr. Ulke.

Differs from the species described below as *stigmaticus* by the greater convexity, the stronger striæ with convex intervals and the prosternal process less strongly ascending. In the three females observed this process is not distinctly visible, but it is probably not margined. This species seems to be somewhat analagous to the Eastern *cardisce*, but it differs by the prosternal process not (?) margined behind and by the narrower hind coxal plates.

5. **C. coxalis** n. sp.—Robust, purplish black, opaque, clothed with yellowish cinereous pubescence, elytra four spotted. Antennæ black, moderately stout and serrate, and longer than the head and thorax in both sexes. Head and thorax densely finely punctate with intermixed sparser coarser punctures. Thorax equally wide as long in the ♂, wider than long in the ♀, convex, sides strongly rounded, more narrowed in front than behind, distinctly longitudinally impressed at middle, basal plicæ well marked, moderate in length, median basal tooth more prominent, hind angles truncate above, produced beneath, the carina not joining the submarginal. Elytra with median and posterior subfasciate yellow spots, moderately convex, sides rounded and gradually narrowed from middle to apex, much as in *cardisce*, strongly striate, more so at sides and apex, punctures strong, intervals flat, rather densely punctured. Beneath shining, moderately densely punctulate and with sparser coarser punctures, hind angles of propleuræ acute, scarcely sinuate within behind, submarginal suture cariniform, reaching the anterior third, postcoxal process short, strongly ascending, not margined behind, hind coxal plates distinctly dilated behind, hind margin of the fourth segment and the fifth segment coarsely, the latter densely punctured. Legs slender, black, of the usual form. Length .25–.27 inch; 6–7 mm.

Oregon, one pair ♂ and ♀ in Mr. Ulke's collection.

Resembles the next, but differs by the color and by the form of the posterior coxæ. The elytra are more acuminate and the head is less coarsely and densely punctured. The ♀ is considerably stouter than the ♂.

6. **C. stigmaticus** Cand.—Robust, or the males frequently small and more slender, black or lead black, opaque with cinereous or yellowish, sometimes coarser pubescence; elytra four spotted or bifasciate with yellow. Antennæ black, not stout, serrate, longer than the head and thorax in the ♂, shorter and more slender in the ♀. Head densely punctate, with sparser, coarser punctures intermixed. Thorax densely less coarsely punctate, coarser punctures sparsely intermixed, sides rounded, somewhat obliquely narrowed behind, as wide as long ♂, wider than long ♀, basal plicæ moderate, hind angles obliquely truncate above, produced beneath, the carina not joining the submarginal behind, basal lobe rather broadly emarginate, bisinuate, the median tooth scarcely evident. Elytra a little wider than the thorax, with the sides rounded and rather more suddenly narrowed at apex than in the last, punctato-striate, intervals rather densely punctulate, flat, a median and posterior yellow spot or fascia. Body beneath, rather strongly punctulate, not closely on the prosternum, closely on the flanks, becoming coarser and confluent behind, the hind margin of the fourth and the fifth ventral coarsely and densely punctured, intercoxal process of the prosternum very short and strongly ascending, not margined behind, hind coxal plates narrowed externally, angles rounded. Legs black or piceous, varied with rufous. Length .20–.30 inch; 5–7 mm.

California.

The larger measurement is of a very robust ♀ coarsely and densely punctured beneath and with four small spots on the elytra.

7. **C. pullus** n. sp.—Small, narrow, very convex, black, rather shining, tibiæ and tarsi pale. Antennæ black, serrate, the second joint more than one half as long as the third, joints 3–6 wider, less than twice as long as wide, outer joints a little narrower. Head feebly convex, impressed before the vertex and behind the frontal margin, which is strong, slightly depressed and subangulate each side at middle, the lateral oblique carina evident, but not marked, rather coarsely and closely punctate. Thorax a little longer than wide, very convex, sides rounded and moderately narrowed in front and behind to the carina, then obliquely a little more narrowed to the tips of the hind angles, a median linear impression faintly evident from before the middle, deeper behind, base strongly impressed each side, lobe broadly emarginate, more elevated at middle, plicæ rather long and well marked, carina distinctly ending inside of and before the apex of the angle, strongly and rather sparsely punctulate on the disc and base with scattered coarser punctures, more densely in front and on the sides. Elytra slightly wider, sides subparallel, rounded and narrowed from behind the middle to tip, which is rather narrow and subacute, very strongly striate, the punctures moderate, rather closely placed, but not deeply impressed nor very evident, intervals very convex, strongly not densely punctulate, with irregularly placed, fine, transverse lines or wrinkles, giving the intervals a somewhat finely rugose appearance. Body beneath with flanks of prothorax rather strongly and subconfluently finely punctate, with sparser coarser punctures evident, prosternum feebly impressed at middle, more shining, sparsely and strongly punctulate, with a few scattered punctures, posterior process short, not margined behind, distinctly, not very strongly ascending, lateral submarginal lines cariniform, feebly curved, extending from apex of hind angles above to before the middle, base feebly sinuate inside the angle, metasternum and abdomen rather strongly punc-

tulate with coarser punctures intermixed, last segment more coarsely and densely punctured. Hind coxal plates slightly narrowed externally with the angles strongly rounded. Legs with trochanters, tibiæ and tarsi, more or less pale, thighs black, tarsi slender, shorter than the tibiæ, the first and last joints of middle and hind tarsi about equal. Length .18 inch; 4.7 mm.

One ♀, Garland, Col., June 22d. Cabinet of Dr. LeConte.

There are traces of a fine cinereous pubescence above and below. Palpi with last joint oval, obliquely truncate at tip. The small size and strongly striate elytra and other characters distinguish this.

8. **C. gemmifer** n. sp.—Very small, shining, black, with yellowish cinereous pubescence, elytra each with two spots. Antennæ black, slender and feebly serrate, stouter in the ♂ and longer than the head and thorax. Head and thorax moderately punctulate and with sparser, coarser punctures. Thorax as wide as long, moderately convex, sides rounded, more narrowed in front, obliquely narrowed behind, more or less longitudinally impressed behind the middle, the impression sometimes more linear and deeper, hind angles produced, not divergent, the carina joining the submarginal behind, median basal lobe feebly tridentate. Elytra rounded at the sides, a little wider than the thorax, striæ hardly impressed, punctured, less distinct at apex, intervals punctulate, a small yellow spot before the middle and a larger, usually paler one before the apex; in one specimen, a ♀ (California), the anterior spots are quite absent and the posterior ones are very small. Body beneath with the usual double punctuation, but it is not very strong, sides of prothorax without coarser punctures, the submarginal line carinate, reaching beyond the middle, hind angle a little sinuate inside, intercoxal process short, margined beneath and distinctly ascending, hind coxal plates dilated externally behind. Legs slender, rufous, thighs darker. Length .20 inch; 5-6 mm.

Nevada, California.

Very distinct by the characters given.

9. **C. tumidicollis** Lec.—Form short, rather robust, black, shining, or sometimes slightly obscure, clothed with fusco-cinereous pubescence. Legs sometimes partly rufous. Antennæ black, second joint two-thirds as long as the third, which is equal to the fourth, stouter in the ♂, as long as the head and thorax, gradually more slender towards the tip. Head and thorax moderately or densely and strongly punctulate, with sparser, coarser punctures intermixed. The thorax is a little broader than long, convex, rather more so in the ♀, frequently finely longitudinally impressed at middle, sides rounded, narrowed in front and obliquely less narrowed behind, not or obsoletely sinuate, basal plicæ rather long and well marked, hind angles prolonged and carinate, the submarginal line joining the carina at the apex of the angle; the basal lobe is strong and tridentate. Elytra moderately convex, two and one-half times the length of the thorax, sides rounded, narrower in front, striæ moderate, with subquadrate or elongate punctures, intervals flat or feebly convex, and more or less punctulate, sometimes finely rugose. Body beneath shining and moderately punctulate, coarser punctures, very feebly evident on the prosternum, more distinct on the

metasternum and abdomen; prosternal process margined behind the coxæ, side pieces strongly sinuate at base inside of the angles, submarginal line visible from above at base, cariniform, feebly descending and more or less impressed, reaching to the middle or to the anterior third. Hind coxal plates with posterior margins transverse. Legs slender, black or varied with rufous; tarsi slender, the first joint of the middle and hind tarsi longer than the last, the second equal to the last. Length .23–.30 inch; 6–7.5 mm.

California, Nevada, Washington Territory.

In appearance resembles immaculate specimens of *fenestratus*, but the sides of the prothorax are not rounded behind, the hind angles are not truncate above and the hind coxal plates are less dilated. The sides of the prothorax beneath are sometimes more coarsely or variolate punctate behind.

10. **C. luridipes** Cand.—Opaque, dull black, with cinereous or fuscous pubescence and suberect bristles. Antennæ black, serrate, about as long as the head and thorax in the ♂, a little shorter and more slender in the ♀. Head densely, finely punctate and with sparser coarser punctures, front broadly rounded, with raised margin, the lateral oblique carina long and strong. Thorax broader than long in the ♀; sides strongly rounded and narrowed in front, obliquely much less narrowed behind, convex, disc feebly or not at all channeled, densely finely punctured with the coarser punctures distinct, or not; base impressed each side, lobe variable, distinctly tridentate or merely bisinuate, plicæ moderately long, well marked, carina joining the submarginal behind. Elytra a little wider than the thorax, feebly convex or subdepressed, sides broadly rounded or subparallel and narrowed from behind the middle, striæ not much impressed, with more or less elongate punctures, intervals flat, moderately punctulate and frequently finely transversely wrinkled. Body beneath more shining, submarginal line of prothorax cariniform, slightly visible at base from above, nearly straight and reaching to the middle or beyond, sides rather densely punctulate at front and middle with coarser punctures more or less evident, coarsely variolate punctate behind, prosternum rather less closely punctulate, with the coarser punctures regularly dispersed, posterior process long, arcuately, or usually feebly ascending, not margined behind, metasternum and abdomen with rather close, double punctuation, the last segment more coarsely and densely punctate at tip, hind coxæ transverse behind. Legs usually with the thighs dark and the tibiæ and tarsi pale, sometimes the tibiæ and tarsi are more or less infuscated or the color may be entirely yellow, tarsi slender, the first joint of the anterior ones equaling the last, in the middle and hind tarsi much longer than the last, which is scarcely longer than the second. Length .25 inch; 6–7 mm.

Ten specimens, California. Structurally, very similar to *tumidicollis*, but differs by the prosternal process not margined behind, by the coarser and denser punctuation, the usually paler legs, the erect bristles, which are usually only feebly evident in that species, and the form rather more elongate. Like that species, also, the hind margin of the prosternum beneath is distinctly sinuate inside the angles.

11. **C. abbreviatus** n. sp.—Form parallel, purple black, opaque, clothed with conspicuous white and fuscous hairs, the bristles scarcely evident. Antennæ black, serrate. Head and thorax finely and densely punctate, the former with the lateral oblique carina distinct, the latter with the sides rounded and narrowed in front, and obliquely moderately narrowed behind, basal plicæ mod erate, hind angles slightly produced, the carina joining the submarginal at apex, but the angle is seen to be distinctly more produced beneath and strongly sinuate inside. The elytra are parallel, briefly rounded at tip, punctate striate, the intervals feebly convex, densely punctulate. In the one specimen before me the disc is clothed with fuscous pubescence, from base nearly to apex with a few white hairs intermixed, while the sides have white hairs with occasional fuscous ones; beneath rather finely punctulate, the coarser punctures more evident on the abdomen. The prosternal lobe appears shorter and less rounded in front than usual, the posterior process very short and strongly ascending, not margined, submarginal lines cariniform, nearly straight, hind coxal plates narrowed externally. Legs slender, thighs piceous, tibiæ and tarsi rufous, tarsi a little stouter and more spinous, the first joint of middle and hind pair but little longer than the last. Length .22 inch; 5.5 mm.

One male, California. Coll. Austin.

I think I saw in Mr. Fuller's collection a more robust female with the fuscous and white hairs more mixed. In the single specimen before me the frontal margin is impressed at middle. The prosternum is shining, very finely, not closely punctulate, the secondary punctures but little larger, the sides of the prosternum beneath are finely and rather closely punctulate over their whole area. The intervals of the elytra are transversely wrinkled. The pubescence is quite long and dense, appressed, and when not rubbed almost completely hides the surface beneath; on the under surface the pubescence is finer and cinereous.

II.

12. **C. erythropus** Er.—Elongate ovate, convex, piceous, acuminate behind, clothed with fine cinereous pubescence, basal two joints of antennæ and legs yellow. The antennæ are slender, feebly serrate, the second joint two-thirds as long as the third. The head is closely punctulate, feebly convex, the frontal margin strongly elevated and broadly rounded. Thorax subopaque, convex, sides strongly rounded and narrowed in front, less narrowed and sinuate behind, the angles carinate and slightly diverging, a short linear impression at middle behind, a transverse one on each side of basal lobe; lobe tridentate, basal plicæ rather short, the external rudimentary ones evident, the disc, base and sides posteriorly, extremely finely and densely punctulate and clothed with extremely fine and short pubescence, anteriorly the punctuation is stronger and less dense and the pubescence is much longer and less fine; there are no coarser punctures evident. Elytra a little wider than the thorax, gradually rounded and narrowed from in front of the middle to the tip, striæ moder-

ately impressed, the punctures not very closely placed, intervals a little convex and punctulate. Body beneath shining, clothed with moderate, yellowish cinereous pubescence; prothorax with the submarginal lines distinct, impressed, rather strongly descending, curved and reaching the middle, intercoxal process long, marginal lines extending to tip, in front feebly joining the antecoxal lines, which are not well marked, sides more closely punctulate than the prosternum, no coarser punctures evident; sides of mesosternal fossa prominent, nearly vertical; metasternum, hind coxæ and abdomen moderately punctulate, and with scattered coarser punctures, last segment of abdomen at sides and tip more coarsely and densely punctured; hind coxal plates transverse behind, angles rounded. Legs slender, the middle and hind tarsi as long as the tibiæ, the joints gradually shorter, the last joint hardly equal to the second, which is much shorter than the first, anterior tarsi shorter, the first joint hardly longer than the last. Length .34 inch; 8.8 mm.

South Carolina, LeConte collection. One specimen in perfect preservation, which appears to be a ♂. Precisely similar to some forms of *convexus*, but will be at once known by the dull lustre of the prothorax caused by the very dense and fine punctuation. There are also two South Carolina specimens in the Cambridge Museum from the Dr. Samuel Lewis collection. In one of them the elytra are paler.

13. **C. angustatus** n. sp.—Slender and elongate, shining black, clothed above with a fine inconspicuous fuscous pubescence and short bristles curved forward on the head and posterior part of the prothorax, and backward on the anterior part and on the elytra, basal two joints of antennæ and legs yellow. Antennæ slender, slightly serrate, longer than the head and thorax, bases of joints frequently more or less reddish. Head with frontal margin elevated, broadly rounded, feebly convex, evenly and moderately punctulate: the thorax is distinctly longer than wide in both sexes, feebly impressed behind the middle, finely not closely punctulate on the disc, a little more strongly and closely at the sides in front, no coarser punctures evident, sides broadly rounded, narrower in front and slightly narrowed behind and sinuate, the angles feebly divergent, strongly carinate, the basal plicæ are rather short, basal lobe tridentate. Elytra a little wider than the thorax, widest behind the humeri, sides gradually rounded and narrowed to the tip, strongly punctate striate, striæ deeper at sides and apex, intervals convex and punctulate. Body beneath clothed with fine cinereous pubescence, closely punctulate, with coarser punctures along the middle of the abdomen, last ventral more coarsely and densely punctate; prothorax with the submarginal lines impressed, curved and reaching beyond the middle, prosternal process long, marginal lines extending to the tip and in front of and not distinctly joining the more or less obsolete antecoxal lines; sides of mesosternal fossa prominent, receding but little from the perpendicular. Legs slender, the middle and hind tarsi about equal to the tibiæ, the first joint longer, the second equal to the last, finely spinous and pubescent beneath, the front tarsi are shorter and stouter and more spinous beneath, the first joint equal to the last. Length .30 inch; 7.7 mm.

Florida, Haulover, March 10. Three specimens, Austin collection; also collections LeConte and A. S. Fuller.

The male has the antennal joints more abruptly dilated to middle, then gradually wider to tips; in the female the joints 3–10 are gradually wider from base to tip, equal in length, the last joint elongate oval, feebly constricted at apical third. More slender than the allied species. The distinctly black color above and beneath and the deeper striæ distinguish it from *convexus* as well as the absence of double punctuation on the prothorax above and beneath. *Florida* is stouter, paler and with the intercoxal lines of prosternum joining well marked antecoxal lines. Intromittant organ of male with the side pieces finely barbed externally at tip.

14. **C. convexus** Say.—Elongate ovate, or variable in form, usually stouter than the last, brown black, fuscous or paler, shining, clothed with more or less dense fusco cinereous pubescence, basal two joints of antennæ and the legs yellow. Antennæ as in the last. Head and thorax rather closely punctulate, the latter more densely at sides and front, the coarser punctures varying from not all to very distinctly evident; the thorax is longer than wide, feebly impressed behind, the sides in both sexes always more narrowed in front, sometimes strongly rounded, sinuate behind with the angles moderately diverging, sometimes more broadly rounded and widest at base, basal plicæ variable in length. Elytra wider than the thorax, finely to strongly striate, striæ punctate, intervals more or less convex, punctulate; sides rounded and narrowed from behind the humeri to apex. Body beneath punctulate, much as in the last mentioned species; prothorax with the submarginal lines varying from a broken, short and faint line to a well impressed one broadly sinuate and reaching beyond the middle, intercoxal process margined behind, the lines variable in front, usually in Northern and Eastern specimens, extending in front of and not joining the antecoxal lines, but in Southern and Western ones confluent with them. Legs as in the last, thighs sometimes slightly fuscous at middle. Length .30—.37 inch; 7.5—10 mm.

Can., Mass, N. Y., Pa., Va., Ill., Mich., Mo., Kans., I. T., Texas, Ga., Fla., D. C.

The antennæ in the male, as in the last, are a little stouter. A species of wide range and showing considerable variation. The elytra are sometimes paler, as are also the antennæ. The hind angles of the thorax and humeri of the elytra are sometimes yellow. In some specimens from Virginia and Florida the base of the elytra is narrowly rufous. The hind coxal plates are sometimes with the posterior margin transverse, the free angle rounded, or narrowed externally and with the angle moderately or broadly rounded; in one specimen they are seen to be distinctly dilated behind. *C. insulsus* Cand. perhaps belongs here, but, having the thorax equally wide as long, it is quite as likely the next species.

15. **C. floridæ** Cand.—Elongate, rather obtuse before and narrowed behind, rufotestaceous or fuscous above and below, clothed with brownish cinereous pubescence and short and fine bristles, the surface beneath shining. Antennæ slender, feebly serrate, joints narrow, elongate, as in the preceding three species, length about equal to the head and thorax, basal two joints yellow, outer ones darker. Head, with a few coarser punctures and thorax thickly punctulate, punctures not evident on the latter; the thorax is convex, scarcely or not longer than wide, more strongly narrowed in front, the sides strongly rounded, narrowed and feebly sinuate behind, the angles hardly or not diverging, faintly channeled posteriorly at middle, the basal plicæ short. Elytra widest behind the humeri thence rounded and narrowed to tip, strongly striate, with rather closely placed subquadrate punctures, intervals convex, punctulate. Body beneath punctulate, sparser, coarser punctures evident on the metasternum, hind coxæ and middle of abdomen; prothorax with the submarginal lines distinct, impressed, reaching nearly to the anterior third, prosternal process long, horizontal as in the previous species, marginal lines extending to tip and confluent anteriorly with the well marked antecoxal lines; mesosternum as in the previous species, hind coxæ with posterior margin transverse, the angle strongly rounded. Legs slender, yellow as in the preceding. Length .33–.35 inch; 8-9 mm.

Florida. Several specimens.

Although the thorax is actually no wider than the elytra the entire insect often has an appearance of being narrowed from the anterior part of the thorax to the tip of the elytra. Very similar to *convexus*, but the shorter thorax and rather more strongly striate elytra as well as the usually paler color seem to distinguish it. The sparser, coarser punctures very evident on the prothorax in some specimens of *convexus* do not here appear. The head and thorax are usually a little darker than the elytra and beneath the pro- and metathorax are darker than the abdomen. If it were not for the existence of a typical specimen in the LeConte cabinet sent by Candèze I should be inclined to refer this species to *insulsus* Cand. and to consider the name *floridæ* as a synonym of *convexus* Say.

16. **C. longior** Lec.—Elongate, shining, black, clothed with fine, inconspicuous, fuscous pubescence and short curved bristles; thorax longer than wide; legs varying from black to yellow. Antennæ slender, as long as the head and thorax, but feebly serrate, joints narrow. Head with the front strongly margined and distinctly produced at middle, impressed behind the margin, faintly bi impressed on the vertex, rather closely punctulate, coarser punctures not evident. Thorax moderately convex in the ♂ or more strongly in the ♀, longer than wide, narrowed before and obliquely a little less behind, and broadly, feebly rounded on the sides in the ♂, or strongly rounded and widest in front of the middle in the ♀, finely, closely punctulate with the coarser punctures scarcely evident to more strongly with the punctures distinct, hind angles not divergent, carinate, basal fissures long, a median posterior linear impression, base tridentate at middle, median tooth broader and less prominent. Elytra with sides rounded and nar-

rowed from behind the middle to the apex, striæ well impressed, moderately closely punctate, intervals convex, rather sparsely punctulate. Body beneath rather closely punctulate, the coarser punctures evident on the metasternum, hind coxal plates and abdomen; prothorax with submarginal lines impressed, extending to middle or anterior third; intercoxal process long, feebly flexed, margined behind, very nearly or quite to apex; the mesosternal fossa has the sides less prominent and more oblique than in the preceding species; the hind coxal plates are nearly transverse posteriorly, the outer angles broadly rounded; legs piceous, varied with rufous, or entirely yellow, slender, the tarsi shorter than the tibiæ, the first joint of the hind tarsi a little longer than the last, that of the middle tarsi about equal in length, and that of the anterior tarsi a little shorter than the last. Length .30–.34 inch; 7.5–8.4 mm.

Bitter Root Valley, Montana, Garland, Col. Collections LeConte and Horn.

The Colorado specimens are a little more convex and more strongly punctulate.

17. **C. nevadensis** n. sp.—Robust, black, lustre dull, almost subopaque clothed with fuscous pubescence and short, suberect bristles, tarsi rufous. Antennæ black, serrate, as long as the head and thorax in the ♀. Head densely, finely punctate, rather broadly impressed behind the front. Thorax densely, finely punctate, convex, broader than long in the ♀, sides strongly narrowed and arcuate in front, moderately narrowed behind, very feebly sinuate, the angles not diverging, scarcely or not impressed behind, the basal fissures moderately long, the basal teeth rounded, the median one obsolete. Elytra a little wider than the thorax, convex, sides subparallel, narrowing at posterior third, striæ moderately deep and narrow, with rather closely placed elongate punctures, intervals moderately convex and rather closely punctulate. Body beneath rather closely punctulate, with sparser coarser punctures intermixed; prothorax with submarginal lines well impressed, short, or reaching the middle, the intercoxal process is moderately long, slightly convex beneath and distinctly ascending, the marginal lines reaching towards the tip; the hind coxal plates are well developed, the posterior margins being transverse, and the exterior angles prominent and rounded. Legs black, tarsi and sometimes the tibiæ in part, rufous, last joint of tarsi longer than the first. Length .35–.37 inch; 9–9.5 mm.

Nevada. Three females, Dr. Horn.

Resembles large specimens of *tenebrosus*, but apart from the intercoxal striæ it is distinguished by the denser punctuation of the thorax and the broader hind coxal plates. The sides of the thorax are but little narrowed behind, the legs are a little stouter than in the same sized specimens of *tenebrosus*, the tarsi shorter and stouter with the first joint more densely spinous beneath. The coarser punctures of the pronotum are evident, but only a little larger than the others.

18. **C. gagates** Er.—Size small or moderate, convex, black and shining, the ♀ frequently stouter, clothed with more or less developed, fine, cinereous pubescence and short suberect bristles. Legs sometimes in part pale. Antennæ rather

stout and strongly serrate, in the ♂ the joints 3-6 one-half longer than wide; punctuation of the head and thorax variable, but usually distinct, with the larger punctures quite evident, sometimes the thorax is only faintly punctulate and very smooth and shining. The thorax is very convex, with the sides strongly rounded and feebly to strongly sinuate behind, rather longer than broad, basal striæ moderate, base tridentate at middle, a feeble impression in front of the base. Elytra somewhat variable in form, sometimes subparallel or again narrowed and rounded from the humeri, punctate striate, intervals convex and punctulate. Body beneath closely punctulate, sometimes strongly, with punctures feebly evident on the prosternum, more distinct behind; prothorax with the submarginal lines impressed, usually reaching the middle or beyond, prosternal process margined somewhat elevated behind; hind coxal plates somewhat transverse behind, the free angles not broadly rounded. Legs black or varied with rufous, tarsi shorter than the tibiæ, the first and last joints about equal in length. Length .20–.30 inch; 5–8 mm.

Nova Scotia, Massachusetts, New Jersey, Pennsylvania, Illinois, Michigan, Virginia, Georgia, South Carolina and Florida.

The largest females are sometimes confounded in collections with *convexulus*, which is a more elongate insect with the thorax longitudinally distinctly more convex, and the prosternal process not margined behind. It is said by Candèze (iii, p. 165) that several examples of the variety with the feet rufous bear the name *lævicollis* in the Dejean collection, and that as Erichson based his description on specimens sent by Dejean it is probable that his *lævicollis* is identical with the present species.

19. **C. togatus** Horn.—Size small, not robust, convex, shining, black, with elytra wholly or partly red, clothed with short and fine pubescence and bristles. Antennæ slender, serrate, longer than the head and thorax in the ♂, shorter in the ♀, the joints more than twice as long as wide. Head and thorax strongly, closely punctulate with coarser punctures intermixed; thorax narrowed in front, sides strongly rounded, narrowed and feebly sinuate behind, hind angles scarcely divergent, median tooth at base obsolete, the lateral ones not very prominent, basal fissures very short. Elytra elongate, subparallel, a little wider than the thorax, at posterior half narrowed and rounded to tip, punctate striate, intervals convex, moderately punctulate, entirely red, or with apical one third or one-half black or piceous. Body beneath rather closely punctulate, coarser punctures not evident on the prosternum, except on the lobe, nor on the sides of the prothorax, distinct behind, submarginal lines of prothorax reaching to anterior third, prosternal process feebly elevated, margined behind the coxæ; hind coxæ strongly narrowed externally, the angles broadly rounded. Legs slender, black, varied with rufous; tarsi slender, pale, the middle and hind ones with the first joint equal to or slightly longer than the last. Length .27 inch; 6.5 mm.

Texas. LeConte collection, Horn, Ulke.

The single specimen with red elytra is a female, the others are of both sexes apparently. Somewhat resembles the last in size and form, but besides the color, the much more slender antennæ and narrower hind coxæ easily distinguish it.

20. **C. Edwardsii** Horn. – Elongate, black, shining; elytra red, with suture and apex more or less fuscous, pubescence fine, moderately dense. Antennæ slender, black, or with basal two joints and the bases of the other joints more or less pale, a little longer than the head and thorax and stouter in the ♂, shorter in the ♀, the joints twice as long as wide, second joint two-thirds as long as the third. Head and thorax rather strongly punctulate, coarser punctures evident. Thorax longer than wide, moderately convex, feebly channeled at middle, broader in the ♀, with the sides more strongly rounded, strongly narrowed in front, moderately behind and feebly sinuate, hind angles sometimes divergent, usually not, basal plicæ long, basal lobe feebly, obtusely tridentate. Elytra considerably wider than the thorax in the ♂, a little wider in the ♀, sides rounded and narrowed behind the middle to the tip. Body beneath punctulate, the coarser punctures evident on the metasternum and abdomen, but not on the prosternum, or sides of prothorax, submarginal lines of prothorax long, prosternal process stout, a little flexed upward, convex and not margined behind, hind coxal plates but little narrowed externally, the angle rather broadly rounded. Legs slender, black, or partly rufous; tarsi slender, about as long as the tibiæ, first joint of middle and hind pair longer than the last, the second about equal to it. Length .34–.37 inch; 8.5–9 mm.

California; Nevada. Collections LeConte and Horn.

Much larger than and quite different from the preceding, which is similarly colored. The tarsi are very similar to those of *convexus* and allies, and the antennæ in the ♂ are almost equally slender. So far as observed the thorax is always distinctly much narrower in the ♂.

21. **C. latiusculus** Esch.—Very robust, obtuse before, acuminate behind, black, opaque, clothed with fusco-cinereous pubescence. Antennæ rather short, serrate, barely equaling the head and thorax in length, joints 3–10 twice as long as wide at tip; in the ♂ the joints are less gradually dilated towards the tip. Head and thorax densely strongly punctulate, with distinct, sparser, coarse punctures intermixed; thorax as wide as long, and as wide as the elytra, convex, longitudinally impressed at middle from near the apex, feebly on the disc to base; basal plicæ long, median basal lobe not deeply bisinuate, sides strongly rounded and narrowed in front, obliquely less narrowed behind, hind angles not or scarcely divergent. Elytra subdepressed, sides rounded or subparallel, narrowed from behind the middle to the tip, which is rather acute, striæ scarcely impressed, the seventh and eighth a little more distinctly so, punctures elongate, rather closely placed, sometimes confluent; intervals flat, with coarse and fine punctures, not densely placed. Body beneath finely punctulate, with sparser coarse punctures, intermixed; propleuræ a little more closely punctulate than the prosternum, with the stronger punctures less evident, submarginal lines reaching the middle or beyond, prosternal process somewhat flexed, not margined behind; hind coxal plates not narrowed externally, angles rounded; legs black, the middle and hind trochanters beneath and knees usual rufescent, tarsi piceous, rather thickly spinous beneath, the first joint shorter than the last. Length .3–.4 inch; 7.5–10 mm.

California, Southern California, Oregon, Washington Territory, Vancouver's Island. In various collections.

The large opaque thorax, the flattened intervals and the acuminate tip of the elytra distinguish this species.

22. **C. tenebrosus** Lec.—Form elongate, parallel, black or somewhat bronzed, clothed with fine fuscous or cinereous pubescence and suberect bristles. Antennæ black, rather slender, longer in the ♂, with the joints thicker, sometimes much stouter. Head and thorax moderately to strongly punctulate, with sparser coarse punctures intermixed, thorax moderately convex, disc usually narrowly impressed from before the middle nearly to base, basal plicæ long, lobe feebly tridentate, the median tooth more or less obsolete, sides strongly rounded and narrowed before, less narrowed and usually sinuate behind, the angles slightly or not divergent. Elytra a little wider than the thorax, moderately convex, sides subparallel, rounded and narrowed at apical third to tip, striæ punctate, feebly to well impressed, intervals flat or moderately convex more or less punctulate with coarser punctures more or less evident. Body beneath closely punctulate with scattered coarser punctures, except on the propleuræ, submarginal lines impressed, usually reaching in front of middle, but sometimes shorter or very short, intercoxal lines disappearing behind, sometimes quite obsolete between the coxæ, hind coxal plates variable, usually narrowed externally with the angles strongly rounded, but sometimes transverse behind. Legs varying from entirely black to entirely red, sometimes slender and with the tibiæ moderately spinous, or stouter, with the tibiæ more strongly spinous, tarsi usually with the first joint distinctly shorter than the last, but also sometimes subequal to it. Length .23–.44 inch; 5.7–11 mm.

Nebraska, Colorado, Wyoming, Idaho, Montana, Oregon, Washington Territory, Vancouver's Island, California, Nevada.

A wide spread and variable species, difficult to limit exactly, but while five or six extremes of variation can be pointed out depending somewhat upon locality, they appear to be connected by intermediate forms. *C. fulvipes* is one of these varieties, *C. montanus* Bland another, and has no relation to *tumidicollis*, of which it has been made a synonym. Nearly a hundred specimens from the various localities indicated have been examined showing considerable variation in all characters. The punctuation is variable, but usually moderate, never so strong as in *latiusculus;* when it is strong the striæ of the elytra are frequently more impressed. The prosternal process is usually well developed and but slightly elevated behind, but it is, however, sometimes seen to be more strongly elevated, usually in smaller and feeble specimens, and in that event dependence must be placed upon other characters. In one variety or race from California, with more cinereous pubescence, black legs and the thorax

not impressed, the form smaller and more slender, it has been noticed that the lateral pieces of the ♂ genitalia are simple and acute at tip, not barbed as usual.

The type of *fulvipes* Lec. is a ♀, feebly purple bronzed; legs entirely yellow. One specimen in the LeConte collection has the thorax densely punctured and opaque, but otherwise seems to be like the type. Some very robust females from Oregon might be confounded with *latiusculus*, but the thorax is finely punctulate, and the males are of the usual form.

23. **C. convexulus** Lec.—Robust, black, shining, clothed with subcinereous pubescence and very fine suberect bristles, *tarsi rufous*. Antennæ black, serrate, as long as the head and thorax in the ♂, with joints broader at middle, shorter in the ♀. Head and thorax punctulate, with sparser coarser punctures intermixed, thorax very convex, tumid above, sides rounded and narrowed in front, less narrowed and feebly sinuate or oblique behind, feebly impressed at middle in front of the base and as usual on each side of the basal lobe, which is tridentate, the middle tooth a little less prominent, basal plicæ moderate. Elytra a little wider than the thorax, punctate striate, intervals feebly convex and punctulate, sides subparallel, narrowed and rounded at tip Body beneath punctulate, the larger punctures not very evident on the prosternum or flanks, distinct behind, submarginal lines of prothorax feeble, rarely reaching the middle and also rarely, quite obsolete, hind coxal plates transverse behind, angles rather strongly rounded. Legs black, tarsi rufous, first joint of middle and hind tarsi about equal to the last. Length .30–.40 inch; 7.2–10 mm.

Canada (Horn), White Mountains, N. H., Mass., Me., Ohio.

Known from the previous species by the greater convexity of the thorax, best compared in a lateral view; the coarser punctures are rather less evident above and the bristles, distinct in well preserved specimens of the last, are here very fine or scarcely noticeable. The ♀ is sometimes very stout, with the alternate intervals of the elytra, especially the sixth and eighth, more elevated.

24. **C. crinitus** n. sp.—Slender, feebly bronzed or black, shining, clothed with more or less distinct white and brownish mixed pubescence and brown bristles. Antennæ black, or with the basal two joints rufescent, slender, not very strongly serrate. Head, more strongly, and thorax moderately closely punctulate, the latter moderately convex, not or scarcely longer than wide, with the sides more or less strongly rounded and narrowed in front and sinuate behind, the angles divergent, impressed in front of the basal lobe and transversely each side, lobe feebly tridentate, plicæ short or moderate. Elytra wider than the thorax, subparallel, moderately convex, punctate striate, the striæ feebly impressed on the disc, more strongly at base and sides, intervals feebly convex or flat, punctulate. Body beneath distinctly, rather closely punctulate, less closely on the prosternum, on which and on the propleuræ the coarser punctures are not evident, punctuation double behind, submarginal lines of prothorax im-

pressed, usually reaching before the middle, prosternal process strongly ascending, marginal lines distinct between the coxæ, hind coxal plates strongly narrowed externally and broadly rounded from the trochanters outward. Legs piceous, varied with rufous, tarsi with the first joint shorter than the last. Length .25–.28 inch; 5.7–7.1 mm.

California. Four males in Mr. Ulke's collection not greatly differing in size; a much larger and more coarsely hairy ♂, with more slender antennæ, in Mr. Austin's. Some of the specimens have three or four broad, faint impressions along the disc of the elytra. The external rudimentary fissure at base of pronotum is not evident. In one of the smaller specimens the submarginal lines are short, not reaching the middle.

25. **C. pubescens** n. sp.—Elongate, moderately slender in the ♂, robust in the ♀, black or fuscous, clothed with a rather dense cinereous pubescence, bristles very fine and scarcely distinguishable or coarser and more evident, legs partly rufous. Antennæ normally black, longer than the head and thorax in the ♂, with the joints broader, much shorter and more slender in the ♀. Head and thorax rather closely punctulate with scattered, somewhat coarser punctures intermixed, or more finely punctulate with the sparser punctures and bristles more distinct; thorax somewhat variable, convex, more narrowed in front, sides broadly rounded or subparallel at middle, or more or less strongly rounded, scarcely sinuate behind, basal lobe feebly bisinuate, impressed in front of and each side of the lobe, plicæ moderately long. Elytra wider than the thorax, striæ impressed, punctate, intervals slightly convex and punctulate. Beneath finely punctulate and pubescent, coarser punctures evident on the prosternum and behind, submarginal lines of prothorax broad and distinct, but very short, not reaching the middle, prosternal process short, compressed behind and strongly ascending, hind coxal plates a little narrowed externally or nearly transverse behind, the free angle rather strongly rounded, legs black or piceous, the tibiæ varied with rufous, the tarsi rufous, the first joint shorter than the last. Length .25–.33 inch; 6–8 mm.

Wyoming (Ulke), two males; New Mexico, one male; Colorado, one male one female (Horn).

Under the above name I have associated five specimens all having a rather long and dense pale cinereous pubescence, the prosternal process short and strongly flexed and the submarginal sutures very short, but distinct. The Wyoming specimens are black; the three specimens in Dr. Horn's collection with the elytra brown, possibly from immaturity. In the Colorado specimens the prosternal process is not so strongly ascending and the last joint of the palpi is narrower than is usual. In all the specimens the last joint of the maxillary palpi is less distinctly triangular.

26. **C. carbonatus** n. sp.—Elongate, black, very opaque, more slender in the ♂ with inconspicuous fine cinereous pubescence and suberect black bristles. Antennæ black, longer and stouter in the ♂, the last two joints passing the base of the thorax, about equal to the head and thorax in the ♀, joints twice as long as wide. Head and thorax very densely punctate, a few coarser punctures evident on the head, but less marked on the prothorax; the thorax is a little longer than wide in the ♂, not longer than wide in the ♀, widest a little before the middle, especially in the ♂, sides rounded and more narrowed in front, obliquely narrowed from the middle behind and not sinuate, feebly impressed behind the middle, more distinctly each side at base, basal lobe broadly emarginate, plicæ moderate, the outer rudimentary one not evident. Elytra a little wider than the thorax, moderately convex, parallel, gradually narrowed and rounded at tip, broadly and feebly impressed before the middle, and with small, scattered, transverse callosities slightly interrupting the striæ, the latter are fine, feebly impressed and with elongate punctures, intervals flat, closely and strongly punctulate. Body beneath closely and strongly punctulate, with very evident coarser punctures intermixed, prothorax with submarginal lines distinct, reaching the middle, prosternal lobe rather short and broadly rounded, or almost truncate in front, posterior process short, lower surface strongly ascending, marginal lines absent behind; hind coxal plates narrowed externally with the free angles rather strongly rounded. Legs black or piceous, varied with rufous at the joints, tarsi rather slender and a little longer in the ♂, last joint longest. The ♂ genitalia have the middle piece slightly broader near the tip, which is rounded, the lateral pieces are broad, rapidly acuminate at the tips, which are minutely excurved and not barbed. Length, ♂ .27 inch; 6.3 mm.; ♀ .30 inch; 7.6 mm.

One pair, California. Mr. Ulke's collection.

A more elongate species than *obscurus*, more densely punctate and more intensely black, with more slender antennæ.

27. **C. obscurus** Lec.—Rather elongate or stouter in the ♀, black, or lead black, subopaque, clothed with distinct fuscous, brown or purple brown pubescence and suberect bristles. Antennæ black, serrate, stouter in the ♂, the broader joints less than twice as long as wide, longer than the head and thorax, more slender and a little shorter in the ♀. Head and thorax densely finely punctate, with sparser coarser punctures intermixed, the thorax convex, as wide as or wider than long, sides strongly rounded and narrowed in front, obliquely less narrowed behind, sometimes feebly sinuate, impressed behind at middle and on each side of the basal lobe which is broadly emarginate and bisinuate, plicæ distinct and moderately long. Elytra a little wider than the thorax, moderately convex, sides parallel, striæ narrow, very feebly impressed on the disc and apex, more distinctly at base especially and sides, punctures elongate, closely placed, intervals flat, rather closely punctulate. Body beneath distinctly and rather closely punctulate, with intermixed coarser punctures, shining and pubescent; prothorax with the submarginal lines distinct, reaching in front of middle, intercoxal process strongly ascending, hind coxal plates a little narrowed externally, the angles strongly rounded. Legs black or piceous, with bases and tips of joints narrowly or broadly rufous, tarsi with the last joint longest. Length .26–.30 inch; 6.2–8 mm.

California. Henshaw, Horn, Ricksecker, Ulke.

The disc of the elytra is frequently broadly impressed at middle and less distinctly behind. Most nearly allied to *æneus*, but not bronzed, and a little less densely punctate, and the second joint of the antennæ is distinctly more than one-half as long as the third. In one ♂ the joints of the antennæ are almost as gradually narrowed as in the ♀.

28. **C. æneus** Horn.—Form as in *obscurus*, coppery or dull bronzed, clothed with rather dense gray pubescence and suberect bristles. Antennæ black, serrate, second joint one-half as long as the third, longer than the head and thorax in the ♂ and stouter, joints 3–6 broadest and about one-half longer than broad, the outer joints gradually more slender. Head and thorax very densely finely punctate, the usual coarser punctures evident, frontal margin depressed and very fine at middle; the thorax is convex, about equally broad as long in the ♂, wider than long in the ♀, the sides strongly rounded and narrowed in front, obliquely less narrowed behind, sometimes feebly sinuate, impressed at middle behind and at base each side, lobe tridentate the median tooth feeble, plicæ distinct, moderate. Elytra a little wider than the thorax, sides subparallel or feebly rounded, subdepressed, punctate striate, with the striæ occasionally interrupted, intervals but feebly convex, usually densely punctulate. Body beneath more or less bronzed, pale cinereous pubescent, strongly and rather closely punctulate, the coarser punctures not very evident on the flanks of the prothorax, elsewhere distinct, submarginal lines of prothorax well marked, usually broad and strongly impressed and reaching in front of middle, prosternal process, moderately long, more or less strongly ascending beneath, marginal lines absent behind the coxæ, hind coxal plates slightly narrowed externally, the angles rounded. Legs bronzed, black or piceous, with the knees, tips of tibiæ and of the tarsal joints rufous, tarsi with the last joint longest. Length .27–.37 inch; 6.5–9.3 mm.

California. In various collections.

The distinctly bronzed specimens are easily recognized, but some of the darker specimens might be confounded with *obscurus*. The tendency of the frontal margin to be depressed has not been observed in *obscurus*.

29. **C. robustus** Lec.—Elongate, stout, or very stout in the ♀, clothed with cinereous and brownish pubescence and bristles, legs rufous. Antennæ black, second joint short, joints 3–6 broader in the ♂, the outer gradually narrower, two or three joints longer than the head and thorax, more slender and shorter in the ♀. Head and thorax strongly punctulate, the larger punctures rarely evident, thorax convex, sides strongly rounded and narrowed in front obliquely narrowed and sometimes feebly sinuate behind, feebly impressed at middle behind and at base each side, lobe tridentate, median tooth distinct, basal plicæ short, distinct. Elytra a little wider than the thorax, sides subparallel or feebly rounded in the ♀, or gradually narrowed and rounded from in front of the middle and strongly narrowed and rounded at tip in the ♂, striæ well impressed at base, less strongly on the disc, punctate, intervals moderately or feebly convex, punctulate. Body beneath strongly punctulate and pubescent, the coarser punc-

tures absent on the prothorax, not very marked behind, punctuation of the prosternum distinctly finer, submarginal lines of prothorax short and feeble, rarely reaching the middle, prosternal process short, usually moderately flexed, with the marginal lines distinct to apex, but specimens have been observed having the process very much attenuated and the marginal lines quite absent, hind coxal plates moderately to strongly narrowed externally with the angle distinct and rounded, or feeble and strongly rounded. Legs rufous, with the thighs usually darker, tarsi moderate, shorter in the ♀, the first joint about equal to the last. Length .28–.40 inch; 7–10 mm.

Mass., N. J., Pa., I. T., Texas.

Two similar males, one from Indian Territory, the other without locality, have the elytra more deeply striate and the intervals more convex. The union of the lateral and discal pubescence of the elytra frequently forms an oblique line from the humeri to the apex The females are sometimes exceedingly robust with the thorax very strongly convex.

30. **C. seniculus** n. sp.—Very small, slender and subdepressed, black, clothed with coarse, depressed, yellow and white pubescence. Antennæ black, second joint small. Head and thorax rather strongly and closely punctulate, thorax not very convex, more narrowed in front, sides rounded and feebly sinuate behind, hind angles not evidently carinate, basal lobe broadly emarginate, feebly bisinuate, basal fissures very short, strictly marginal, the outer rudimentary ones not evident, base very deeply impressed each side of the lobe, not impressed at middle; elytra depressed, sides parallel, striæ feebly impressed, intervals flat, punctulate. Body beneath punctulate, pubescent, submarginal lines of prothorax reaching the middle, prosternal lobe short, broadly rounded, posterior process short, strongly flexed, marginal lines not reaching behind the coxæ, the hind coxal plates appear to be narrowed externally with the angles rounded. Legs with the thighs piceous, rufous at base and tip, tibiæ rufopiceous, tarsi paler, first joint shorter than the last. Maxillary palpi dark piceous, the last joint elongate, gradually and moderately dilated to tip, which is subtruncate. Length .20 inch; 5 mm.

California. One male, Dr. Horn.

The single specimen is not in very good condition. The basal two joints of the antennæ alone are present. Seems quite unlike anything else by the characters above. The male appendages are exserted, the central piece is longer, slender and blunt at tip, the lateral pieces broad, gradually narrowed to near the tip and then suddenly narrowed and finely barbed at tip.

31. **C. dispar** n. sp.—Rather slender in the ♂, ♀ robust, black, with fusco-cinereous pubescence and conspicuous erect bristles. Antennæ black, slender and one half as long as the body in the ♂, in the ♀ very short, one-half as long as the head and thorax, finely serrate, with the joints, except first, third and last, not longer than broad; palpi black, last joint narrow, oval, pointed at tip. Head

rather densely punctate, impressed behind the frontal margin, which is somewhat depressed at middle; thorax more finely and less densely punctulate, convex, feebly longitudinally impressed from before the middle nearly to base, sides strongly rounded, more narrowed in front, as long as wide and sinuate behind in the ♂, wider than long, and less sinuate in the ♀, somewhat transversely impressed each side at base, lobe broadly emarginate, fissures moderate, the outer not evident, hind angles carinate. Elytra a little wider, subdepressed in the ♂, very convex in the ♀, a little wider behind the humeri, which are distinct, then parallel to near the apex, whence they are strongly rounded, striæ narrowly impressed, punctures fine, rather distant, intervals moderately convex and punctulate. Body beneath finely not densely punctulate, with apparent coarser punctures intermixed on the sides of the prothorax as well as elsewhere, submarginal lines of prothorax quite absent, intercoxal process very short and strongly attenuated and ascending behind, anterior lobe short and broadly rounded, hind coxal plates prominent and produced between the legs, but not at all dilated externally nor transverse, the outer margin obliquely sinuate from the inner posterior angle outward. Legs black or piceous, stouter in the ♀, the tibial spurs short, stouter than usual, tarsi much longer in the ♂, the last joint very long, in the ♀ the tarsi are very short, scarcely exceeding one-half the length of the tibiæ, the last joint relatively long, about equal to joints 1 and 2, claws simple. Length, ♂ .25 inch; 6 mm.; ♀ .33 inch; 8 mm.

California. One pair, Dr. Horn.

A very peculiar species, easily known by the characters detailed. The ♂ genitalia have the lateral pieces distinctly barbed externally at tip, the middle one slender and a little longer, as usual. The hind coxæ are of the same form essentially as seen in *Eniconyx*, which tends to confirm Dr. Horn's suggestion as to the relationship between the *Cardiophori* and the *Aphrici*. The species should probably be placed in a new genus.

Elater filius Randall has been supposed to possibly belong to the present genus, but the description does not apply to any species known to me.

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30. C. seniculus n. sp.
31. C. dispar n. sp.

On the species of MACROPS Kirby, inhabiting North America.

BY WILLIAM G. DIETZ, M. D.

In separating the smaller species of Listroderes Sch. under the generic name Hyperodes, Mr. H. Jekel* apparently failed to recognize the Kirbyan genus Macrops,† each having for its type *Listroderes humilis* Gyll. Lacordaire, in his classical work, merely mentions the genus‡ among the "Genres incertæ sedis." Kirby, in his description, speaks of the beak as being "shorter than the thorax." This character, strictly adhered to, would exclude a number of species evidently belonging here and lacking the essential characters of any of the other genera of Phytonomini known to me and necessitate the formation of one or several new ones, a course not calculated to advance the interests of science, nor diminish the difficulties, already too numerous, in the way of the student. A second character, "tarsi not dilated," is only partially true, as the anterior tarsi of the males at least, are moderately dilated in all the species. With these modifications, increasing its scope, the genus retains all the characteristics attributed to it by its author.

Family CURCULIONIDÆ.

Tribe PHYTONOMINI.

Ventral segments not very unequal; postocular lobes of prothorax obsolete. PHYTONOMI.

Articular surface of hind tibiæ well defined, terminal.....PHYTONOMUS.

Articular surface of hind tibiæ ill defined, oblique.....LEPYRUS.

Ventral segments very unequal, third and fourth short, united equal to one of the others.....LISTRODERI.

Tibiæ strongly mucronate; second joint of funiculus much longer than the first.....LISTRONOTUS.

Tibiæ feebly mucronate; second joint of funiculus as long, or but little longer than the first.....MACROPS.

* Annales de la Soc. Entom. de France, 1864, p. 538.

† Fauna Boreali-Am. vol. iv, p. 199.

‡ Genera des Coléoptères, vol. vi, p. 622.

MACROPS Kirby.

Hyperodes Jekel.

Head short, transverse. Eyes lateral, not encroaching upon the front, transversely oval, coarsely granulate. Rostrum deflexed, variable in length and thickness, narrower than the head and slightly widened at tip, which is not emarginate; uni- or pluricarinate. Scrobes long, directed against the eyes, profound and visible from above anteriorly, superficial and more or less expanded posteriorly; prolonged to the buccal opening by a narrow fissure. Antennæ moderate, subapical; scape long, incrassate at its extremity and reaching the anterior margin of the eye; funiculus 7-jointed, 1st and 2d joints equal, or else 2d joint about one-half longer than the 1st, latter always stouter; following joints submoniliform, 3–5 of about equal width, 6th slightly, 7th distinctly wider and more or less subcontiguous to the club, latter oblong-elliptical, pubescent and annulate. Thorax subconvex, variable in form, never longer than wide; lobes distinct; prosternum emarginate, scutellum small. Elytra oblong-oval, wider than the thorax, emarginate at base, very rarely subtruncate; very slightly attenuate towards the apex; posterior callus at most feeble, striate-punctate; all, or alternate interstices only, with rows of setigerous punctures. Side pieces of metathorax narrow, dilated anteriorly; intercoxal process moderately wide, third and fourth abdominal segments short, scarcely exceeding together one of the others. Legs variable, femora clavate, tibiæ emarginate internally, with the internal apical angle produced, and at most moderately mucronate. Tarsi variable, anterior tarsi generally slightly shorter and stouter, with the 3d joint moderately dilated in the males, hind tarsi slender (except *solutus* group).

The genus as thus defined comprises a number of small species, mostly undescribed, the largest of which scarcely 5 mm. .20 inch. in length.* It approaches Listronotus very closely through the *solutus* group, while the next one shows an almost equally strong tendency toward Phytonomus, but readily distinguished from the latter by the short third and fourth abdominal segments and the eyes not encroaching upon the front. The latter characters I consider of more importance than the relative length of the abdominal segments in separating the two genera. *Phytonomus punctatus* Fabr. (*opimus* Lec.),

* The measurement is taken from the anterior thoracic margin to the apex of the elytra.

type of *Donus* Meg. has the third and fourth abdominal segments very short. The tibial mucro is more strongly developed in the long beaked species. In the *solutus* group alone do we find all the tarsi equally dilated, as in most Listronoti; all the other species have the hind tarsi longer and slender.

The species are most closely related and often difficult to separate, and, as far as my observation goes, poorly represented in the majority of collections, due, probably in part, to the small size of most of them and also to an apparent lack of interest in the Rhynchophorous series in general. As to their habits of life I have nothing to offer. The majority of the long beaked species appears to be phytophagous, while the short beaked ones seem to be more geophagous in their habits. Some of those found on the ground under stones, etc., are encrusted with earthy material, glued together by some exudation from the derm and generally difficult to remove.

The geographical distribution is somewhat interesting. The majority of the species seem to prefer the temperate belt of the Atlantic slope, but relatively few being found on the Pacific side of the Rocky Mountains. Florida possesses a few, especially interesting species of its own, whose congeners may probably be looked for among the insect faunas of the West Indies.

The males have the last ventral segment subtruncate, the anal segment frequently protruding. The females have the same segment broadly rounded.

Although placed by Jekel among his *Platygyni heterorhini*, I have often failed to recognize a difference in the rostrum of both sexes.

The basis for the diagnosis of the species into groups is evident, and needs no further elucidation.

In concluding these prefatory remarks I take this opportunity to express my thanks to all who have assisted me with the material at their disposal, especially so to my friends Dr. Horn and Mr. Ulke, without whose rich collections this paper would have fallen short in attaining its purpose, and to the former also for kind advice in the preparation of the same.

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Synopsis of Groups.

Second joint of funicle slender and longer than the first, latter stout, subturbinate. All the tarsi stout, third joint dilated, bilobed; last joint shorter than the others combined. Plate I, fig. 1...**SOLUTUS** Group.

First and second joints of funicle equal, or nearly so, except in *hyperodes*. Plate I, fig. 3.

Rostrum more slender, about as long, or longer than the thorax. Scrobes narrow, sharply defined and but slightly expanded posteriorly. Plate I, 6*b*.

Elytral interstices wider than the punctures; sexes alike in form.

Rostrum cylindrical; legs long and slender; anterior tarsi of ♂ but feebly broader than hind tarsi, last joint as long as the others combined. Plate I, figs. 3 and 3*b*.....HYPERODES Group.

Rostrum broader and depressed at base, generally somewhat compressed toward the tip. Legs stouter; tibiæ denticulate internally, anterior tarsi of ♂ dilated. Plate I, figs. 6 and 6*b*.....ULKEI Group.

Elytral interstices narrow, punctures large, foveiform; sexes dissimilar. Plate I, figs. 8, 9 and 10.....HORNII Group.

Rostrum stouter, shorter than the thorax, generally flattened above. Scrobes expanded and ill defined posteriorly (except *porcellus*). Plate I, figs. 11, 12 and 15.

Squamose species; elytra not clothed with a fine squamulose, or hair-like pubescence.

Upper margin of antennal grooves directed towards the upper part of the eyes; scape reaching the upper anterior margin of the same. Plate I, figs. 11 and 12.

Thorax coarsely punctate; posterior tibiæ of ♂ with a brush of long, flying hairs along the inner margin. Plate I, fig. 11*b*.

DELUMBIS Group.

Thorax very finely punctured, hind tibiæ of ♂ without a brush of long flying hairs.....SPARSUS Group.

Upper margin of antennal grooves directed toward the middle of the eye; scape of antennæ shorter and attaining the anterior margin of the eye, about its middle; densely scaly; each elytral interstice with a row of setæ. Plate I, fig. 15 *b*.....HIRTELLUS Group.

More or less pubescent above; anterior tarsi of ♂ distinctly dilated; alternate interstices of elytra above with a row of setæ.

HUMILIS Group

SOLUTUS Group.

The species comprising this group form a natural transition to Listronotus, and are readily recognized by the characters given in the table. They are densely covered with ochreous or grayish brown scales. The antennæ rather stout; first joint of funicle stout, subturbinate, second about one-half longer than the former, following joints gradually wider, seventh rather closely united to the club. Legs rather slender; tibiæ, especially the anterior ones, incurved at apex, not denticulate internally. All the tarsi dilated; third joint rather broadly bilobed; fourth shorter than the others combined.

The species are distinguished as follows:

Elytral setæ very small, inconspicuous; thoracic punctures moderate.

Elytra with a dark, denuded fascia; thorax scarcely wider than long.

1. **solutus.**

No elytral fascia; thorax distinctly wider than long.....2. **indistinctus.**

Elytral setæ stout, very evident; thorax coarsely cribrate.....3. **cryptops.**

M. solutus Boh.—Oblong elliptical; piceous. Above densely covered with pale ochraceous scales; beak moderately stout; tricarinate; median carina entire, lateral ones abbreviated, indistinct; densely scaly. Scrobes attaining the middle of eyes. Antennæ fuscous, club darker. Head convex, finely punctured sparsely covered with piliform scales. Thorax subquadrate, scarcely wider than long; sides almost straight, slightly narrowed at apex; densely punctate; punctures moderate; surface densely scaly: scales round, of moderate size and somewhat umbilicated, intermixed with very short, suberect hairs. Lateral and median line of paler scales, latter often obsolete. Thoracic lobes moderately prominent, only partially covering the eyes in repose. Elytra one-half wider than thorax, subconvex; parallel for two-thirds their length, thence narrowed and distinctly compressed towards apex, with the posterior callus rather evident. Striæ fine; punctures subquadrate, not very closely placed; intervals flattened, each with a row of very short, inconspicuous setæ. A broad, dark, denuded, subtriangular fascia, occupying the middle of each elytron, with the apex directed toward the suture, which, however, is scarcely attained. Elytra rather strongly inflexed in their apical half, causing the abdomen to appear somewhat narrowed. Beneath, dark piceous, glabrous; rather densely, but finely punctate, except first and second abdominal segments, where they are more distant: each puncture bearing a short, scale-like hair. Legs rufo-piceous; femora moderately clavate, infuscate at middle and with a ring of pale scales near apex. Length 3.5–5.0 mm.; .14–.20 inch.

♂. Last ventral segment not, or very slightly impressed longitudinally.

♀. Last ventral with a large, but shallow fovea; elytra a trifle wider behind middle.

Hab.—New York, District Columbia, Iowa, Northern Illinois, Kansas.

M. indistinctus n. sp.—Very similar in form and appearance to *solutus* from which it differs by being a trifle stouter; thorax distinctly wider than long, its prothoracic lobes rather more prominent and complete absence of denuded elytral fascia.

Sexual characters same as *solutus*. This is probably *L. spurcus* Boh.

Hab.—New Jersey, New York, Illinois, Montana, Wyoming.

M. cryptops n. sp.—Robust, piceous brown; covered above and below with rounded, grayish scales. Rostrum rather stout, with a broad, shallow sulcus between the lateral elevated lines; median carina feeble, generally concealed by the scales Antennal grooves attaining the eyes rather below the middle. Eyes subconvex and surrounded by a distinct groove, completely covered in repose by the prothoracic lobes. Thorax subquadrate, moderately convex, slightly wider at base than at apex. Sides almost straight for three quarters their length, then slightly narrowed to apex; coarsely cribrate; punctures almost hexagonal and separated by very narrow ridges, each covered by a large, umbilicated scale. A narrow median and lateral line of paler scales. Postocular lobes very strongly developed, causing the prosternum to become more deeply emarginate. Elytra

one-half wider than thorax, convex; parallel for three-fourths their length, then gradually narrowed and conjointly rounded at tip. Posterior callus slightly evident; striæ rather broad, well impressed, with close set, subquadrate punctures, almost completely concealed by the scaly vestiture; interstices slightly convex, each with a row of stout, claviform setæ. Beneath not very densely punctured, third abdominal segment less so; last three segments paler. Legs piceous. Length 4–5 mm.; .16–.20 inch. Plate I, fig. 2.

♂. Last ventral with a vaguely impressed, subtriangular space.

♀. Last ventral with apical, triangular fovea.

Easily recognized by the peculiar thoracic scales and sculpture.

Hab.—Florida, Georgia.

HYPERODES Group.

But two species, known to me, belong to this group. The beak is cylindrical, scarcely wider at base than at apex. Prothoracic lobes feeble; legs long and slender; tibiæ incurved at apex with a smooth groove in their distal half internally, not denticulate along the inner margin, but more strongly emarginate than is usual in this genus; densely scaly, scales have a more or less metallic lustre. The two species are from the Pacific slope, and appears to be very rare; they are readily distinguished as follows:

Antennæ slender, second joint of funicle longer than the first; no frontal fovea. **hyperodes.**

Antennæ stouter; first and second joints of funicle equal; distinct frontal fovea. **nevadensis.**

M. hyperodes n. sp.—Rather slender, elongate; piceous black; moderately convex; densely covered above and below with small, round scales, varying in color from brassy, ochreous brown to grayish, intermixed with fine, short, suberect hairs. Head and rostrum distinctly longer than thorax; beak moderately stout, cylindrical; a median elevated line, entire; no trace of a lateral carina; densely covered, like the head with small brassy cupreous scales. Antennæ slender, with the second joint of funicle distinctly longer than first, 3–5 submoniliform; 6–7 slightly transverse; clava darker. Head slightly convex. Eyes large, broadly oval, oblique. Thorax slightly wider than long, somewhat narrower at apex than at base; latter feebly, sides broadly rounded and very narrowly constricted at tip. A narrow median vitta and a bisinuate lateral one each side of paler color. The fine hairs intermixed with the scales are almost prostrate and directed backward. Elytra one third wider than the thorax, slightly narrowed from base to about three-fourths their length, then more rapidly to and conjointly rounded at tip. Striæ well impressed with rather large, subquadrate, not very closely placed punctures; intervals flat (slightly convex where denuded), finely punctulate and each with a row of moderately long, but slender setæ; an oblique impression near the base, extending from the fifth to second interstice; underneath densely scaly, intermixed with short hairs. Legs

slender; anterior tibiæ incurved at tip; all the tarsi equal, scarcely dilated in the ♂. Length 4.5 mm.; .18 inch. Plate I, figs. 3, 3*b*.

♂. Last ventral scarcely impressed.

♀. Last ventral with a narrow, ill defined, longitudinal fovea.

The scales along the suture and thoracic vittæ have a decidedly brassy lustre, while those of thighs are greenish in one specimen (♂), while in the others they are of a more uniform, grayish color.

Hab.—California. Mr. Ulke's collection; two specimens.

M. nevadensis n. sp.—Smaller and more convex than the preceding species; dark piceous; densely covered with pale, silvery scales, having a slight pearly lustre, mottled above with darker spots; beak as long as the thorax, rather stout, strongly convex, with scarcely a trace of a median, elevated line, and, like the head, densely scaly, intermixed with a fine hair-like pubescence; a broad, transverse, shallow groove at base. Head very convex, with a deep, frontal fovea. Thorax one-fourth wider than long; base scarcely wider than apex; sides strongly rounded, suddenly and distinctly constricted at tip, the constrictions extending as a distinct, transverse impression to, but not involving the median line; a narrow median and a lateral, bisinuate line, paler. Elytra one-half wider than base of thorax; almost truncate at base; sides parallel for two-thirds their length, then gradually narrowed and conjointly rounded at tip; humeri prominent; striæ well impressed, punctures evident, somewhat distant; intervals slightly convex, each, except second, with a row of long, conspicuous setæ; surface slightly mottled with darker scales; a pale strip extending from humerus along the sides. Beneath, silvery white. Legs slender; antennæ and tarsi rufous. Length 4 mm.; .16 inch. Plate I, fig. 4.

♀. Last ventral with a small, round, apical fovea.

Hab.—Nevada. A single specimen of this pretty species in Mr. Ulke's collection.

ULKEI Group.

The species of this group are easily distinguished by their subdepressed form; beak rather slender, tapering more or less distinctly from the base to the insertion of the antennæ and generally compressed toward the apex. The prothoracic lobes are feeble; the tibiæ denticulate and setigerous along the inner margin; anterior tarsi of ♂ distinctly dilated; hind tarsi slender.

The following table will enable the student to identify the species:

Larger species 4.0 mm. or over; no distinct superciliary ridge and sulcus.
Third tarsal joint distinctly longer than the second; thorax punctured.
Antennæ and tibiæ slender; tarsi fringed with long, flexible hairs, without stiff bristles; third tarsal joint twice as long as the second.
Sides of thorax strongly rounded behind the middle; elytral striæ feebly impressed ..... **grypidioides.**

Thorax broadly rounded at the sides; striæ strongly impressed; color dark piceous..... **Wickhami.**

Thorax strongly rounded at the sides; striæ strongly impressed; color grayish white..... **interpunctatulus.**

Tibiæ shorter and stouter; tarsi fringed at the sides with stiff bristle-like hairs, intermixed with short pubescence.

Third tarsal joint scarcely one-half longer than the second; piceous, variegated with white..... **Ulkei.**

Third tarsal joint almost twice as long as the second; variegated with brown..... **dorsalis.**

Third tarsal joint scarcely longer than the second; thorax granulate. **tenebrosus.**

Smaller species, not exceeding 3.5 mm.; a superciliary ridge and sulcus generally distinct.

Alternate elytral interstices more prominent, above setigerous. **alternatus.**

Each elytral interstice with a row of setæ.

Interstices of equal width; scape of antennæ of usual length... **montanus.**

Interstices of unequal width; scape of antennæ short..... **interstitialis.**

M. grypidioides n. sp.—Oblong, piceous; antennæ, tibiæ and tarsi paler; beak slightly longer than the thorax, slender and but little widened towards the base, narrowed about the middle; tricarinate, coarsely punctured and sparsely clothed with round scales, intermixed with transversely directed, scale-like pubescense, separated from the front by a slight, transverse furrow. Antennæ slender. Head transverse, convex and rather densely clothed with round scales, having, like those of the rostrum, a slight pearly lustre. Thorax urn shaped, one-half broader than long, widest behind the middle, strongly rounded at the sides behind and feebly constricted at apex; base broadly rounded; lobes feeble, leaving the eyes almost entirely uncovered in repose; surface finely and densely punctured, transversely impressed in front and densely covered with grayish brown scales; median vitta narrow, obsolete about the middle, lateral vittæ broader, bisinuate. Elytra one-fourth wider than the thorax at its widest, slightly emarginate at base; humeri rounded, prominent; moderately convex and parallel for two-thirds their length, gradually narrowed to and conjointly rounded at tip; striæ fine, moderately impressed, with small, not very approximate punctures; interstices broad, feebly convex, each with a row of setigerous punctures; setæ short, slender and inconspicuous; densely clothed with grayish brown scales, indistinctly mottled with paler spots, especially along the sides; scutellum and humeral spots white. Beneath: thorax with large, superficial punctures, densely scaly; abdomen glabrous, or nearly so, punctures smaller, setigerous. Legs with a few scattered scales, tibiæ slender, incurved at tip and distinctly denticulate along their inner margin, each denticle bearing a distinct seta; tarsi fringed with long, slender hairs, fourth joint longer than the others combined. Length 4.0–4.5 mm.; .16–.18 inch.

♂. Last ventral segment with triangular flattened space.

♀. Last ventral segment with a longitudinal groove at its distal half, causing it to become narrowly emarginate.

Has considerable resemblance to *Grypidius brunneirostris.*

Hab.—Kansas, Nevada, Texas, S. Wyoming.

M. Wickhami n. sp.—Oblong, dark piceous, densely clothed above with dark colored scales, somewhat mottled with paler spots; rostrum slightly longer than the thorax, wider at base and somewhat compressed toward the apex, latter declivous beyond insertion of antennæ. A distinct median carina extending from apex to a level with the insertion of the antennæ, a lateral, indistinct one, commencing about this point, but does not reach the base. The space between the lateral carinæ is occupied by a groove more or less distinct and extending somewhat upon the front; surface not very densely clothed with cupreous scales, each lateral carina bearing a row of stout, erect, clavate hairs. Head as in the preceding species. Thorax wider than long, slightly narrowed at apex; sides very broadly rounded and moderately but broadly constricted at tip; base broadly constricted at tip; base broadly rounded; a median narrow line and sides paler, latter enclosing an ill defined, dark spot. Elytra scarcely one fourth wider than the thorax, subparallel for two-thirds their length, more rapidly narrowed to and conjointly rounded at tip; emarginate at base. Striæ well impressed, with moderately large, approximate punctures; interstices not very wide, somewhat convex, especially at the convexity, where they appear alternately a trifle more prominent, each bearing a row of long, slender setæ; sides of elytra, scutellum, humeral and some ill defined discal spots, paler. Beneath almost glabrous, with a few scattered, brassy scales. Legs slender, tibiæ denticulate within, but less distinctly incurved at apex; thighs with a few brassy scales. Length 4.0–4.5 mm.; .16–.18 inch.

♂. Last ventral slightly impressed.

♀. Last ventral segment with a rather large, but not sharply defined, apical fovea.

Hab.—New Mexico. Three specimens in my collection were collected by my friend, Mr. H. F. Wickham, of Iowa City, to whom it gives me pleasure to dedicate this species.

M. interpunctatulus n. sp.—Oblong, black; antennæ, tibiæ and tarsi rufous, densely clothed above and beneath with grayish white scales, slightly mottled above with light brown; beak somewhat stouter than in the preceding species, a little wider and flattened at base, coarsely rugoso-punctate; tricarinate, median one indistinct; densely scaly, concealing the sculpture. Antennæ as in the preceding, though a trifle stouter. Head broad, subconvex, with an obscure frontal impression, densely scaly. Thorax scarcely one-half wider than long; base slightly, sides broadly rounded from base to apex, latter scarcely constricted, but with a transverse, lateral impression; densely and very finely punctured; ridges between the punctures with a fine, but distinct puncture at their juncture with each other; vittæ as in *grypidioides*. Elytra as in the latter, but striæ deeply impressed, punctures larger; interstices more convex, punctulate and finely rugulose; not very densely punctured beneath; tibiæ a little stouter and fourth tarsal joint scarcely as long as the others combined. Length 4.0—4.5 mm.; .16–.18 inch.

♂. Last ventral with apical, subquadrate impression.

♀. Last ventral with triangular fovea near apex.

Hab.—Kansas, Texas, Nebraska (Dr. Horn and Mr. Ulke's collection).

M. Ulkei n. sp.—Stout, oblong, piceous, slightly convex, densely scaly above and beneath; beak as long as the thorax, broader and flattened at base, tricarinate; sculpture concealed by the scales, latter brown, a median vitta tapering to apex and one each side white; front broadly flattened with an indistinct, transverse impression. Thorax one-half wider than long, base broadly rounded, wider than apex; sides as in *interpunctatulus*. Surface densely punctate; concealed by the scaly vestiture; latter brown, with three distinct and rather broad vittæ, white; median one consisting of two rows of scales separated by a fine, impressed line; lateral ones slightly bisinuate; sides of thorax whitish; the erect, club shaped hairs, like those of head and beak, are rather stouter than in the preceding two species. Elytra one-fourth wider than thorax; striæ well impressed, punctures distinct; interstices almost flat, slightly unequal in width, each with a row of claviform setæ. Scales brown, variegated with white; a broad discal stripe, commencing at base and almost reaching the apex, white; a line extending from near the humeral angle, diagonally toward the suture, brown; humeral spot and scutellum white. Body beneath densely punctured; scales grayish brown. Legs densely scaly; femora annulated with white near the apex, and, like the tibiæ, stouter than in the preceding two species. Tarsi fringed at the sides with stiff hairs, intermixed with long, soft pubescence; third joint scarcely one-half longer than second. Length 4.5–5 mm.; .18–.20 inch. Plate I, fig. 5.

♂. Last ventral slightly concave.

♀. Apex of last ventral impressed, emarginate.

A distinct and easily recognized species. The white scales of the elytra vary greatly in extent.

It gives me pleasure to dedicate this species to my friend, Mr. H. Ulke, of Washington, to whom I am greatly indebted for favors received.

Hab.—Dakota, Texas, Wyoming, N. B.

M. dorsalis n. sp.—Very closely allied to the preceding, from which it differs as follows: Markings identical, but the white of the former is here replaced by pale brown; less sharply defined. Thorax more than one half wider than long and more strongly rounded at the sides; elytral striæ finer, feebly impressed. Third tarsal joint distinctly longer, almost twice the length of the preceding, more deeply bilobed.

♂. Last ventral segment with an ill defined, triangular, smooth flattened space.

♀. Apex of last ventral with a profound, sharply defined, lunate fovea; deeply emarginate.

Might easily be taken for *Ulkei*, to which it has a deceptive resemblance. The above characters, however, will readily decide the identity. A specimen in Dr. Horn's collection has the scales almost white, and decidedly preponderating.

Hab.—Illinois, Texas, Louisiana. Four specimens.

M. tenebrosus n. sp.—Oblong elliptic; rather stout, dark piceous. Antennæ, except clava and tarsi, paler; beak moderately stout, broader at base subconvex with fine, feeble, elevated lines; densely scaly, intermixed with stout, short, erect hairs. Head transverse, subconvex, with an obscure frontal fovea. Thorax subquadrate, transverse, more than one-half wider than long; base slightly rounded, with the hind angles almost rectangular; sides straight for three quarters their length then rather suddenly rounded to and distinctly constricted at tip; subconvex, finely granulate and densely covered with small, round scales, intermixed like those of head and beak, with short, stout hairs; vittæ obsolete. Elytra one half wider than thorax, scarcely emarginate at base, parallel for two-thirds, then gradually narrowed to tip, which is slightly compressed. Striæ well impressed, punctures rather large, subquadrate and approximate; interspaces convex, third and fifth a little more elevated near the base; finely punctulate and transversely rugulose; each with a row of short setæ, densely scaly, uniformly dark piceous, concealing the punctures. Beneath covered with dirty brown scales, rather larger than above; punctures shallow, close. Legs densely scaly, stout, tibiæ broad, compressed and distinctly bisinuate within. Third tarsal joint scarcely longer and wider than the second; fourth as long as the others combined; finely pubescent beneath. Length 4.5–5 mm.; .18–.20 inch.

♂. Last ventral with a rather large impression, not emarginate.

♀. Last ventral with apical fovea, slightly emarginate.

Hab.—Montana, Dakota, Wyoming. Three specimens in Mr. Ulke's collection.

M. alternatus n. sp.—Oblong, subdepressed; piceous brown; densely scaly above, almost glabrous beneath. Scales matted together by an exudation from the derm, giving the insect a somewhat crusty appearance and completely concealing the sculpture beneath; very similar in form and general appearance to *M. tenebrosus*, but much smaller. Rostrum rather stout, as long as the thorax; scarcely wider at base than apex, slightly narrowed about the middle; sharply tricarinate; scrobes profound, their upper margin prolonged as a supraorbital ridge, between which and the eye there is a distinct sulcus. Head transverse, subconvex. Thorax transverse, almost twice as wide as long, subquadrate, scarcely wider at base than apex; base rounded, hind angles oblique, sides straight, obscurely sinuate about the middle, gradually narrowed, but not constricted at tip; disc indistinctly impressed each side behind the apex; another oblique impression each side behind the middle; a small, denuded spot shows surface densely and finely punctate. Elytra one-fourth wider than the thorax, same form as in *tenebrosus*, but not compressed toward the apex; alternate interspaces subcostate, with a row of rather stout, conspicuous setæ. Striæ well impressed, punctures large and very approximate. Beneath almost glabrous, coarsely and densely punctate, each puncture bearing a short setæ. Legs moderately stout; tarsi with the third joint one-half longer than second, fringed with long pubescence. Length 3.5 mm.; .14 inch.

A unique specimen, a ♂, in Mr. Ulke's collection is before me. The last ventral is faintly impressed near the apex. This species can hardly be confounded with any other Macrops known to me.

Hab.—Illinois.

M. montanus n. sp.—Oblong, dark piceous; antennæ and legs rufous. Above and underside of thorax densely covered with grayish-brown scales; beak rather slender, a trifle longer than the prothorax; wider, but not flattened toward the base; obscurely tricarinate; separated from the front by a curved impression. Scrobes, supraorbital ridge and sulcus, as in *alternatus*. Head transverse, convex and like the beak, densely scaly. Thorax transverse, nearly twice as wide as long; wider at base than apex. Sides rather strongly rounded, widest a little behind the middle; feebly constricted at tip and transversely impressed behind the anterior margin. Surface finely granulate, completely concealed by the scaly vestiture; a median, straight and a bisinuous vitta each side of paler scales. Elytra scarcely one-fourth wider than the thorax; striæ strongly impressed with distant punctures, latter concealed by the scales; interstices subconvex, of equal width, each with a row of short, stout, suberect setæ. Scutellum and humeral spots white; surface, especially sides, mottled with paler spots. Abdomen with a few scattered scales, densely punctate, each puncture bearing a short seta. Legs moderately stout, femora with a ring of paler scales near the apex; tibiæ moderately stout, scarcely compressed; tarsi as in *alternatus*, pubescence shorter. Length 3.5 mm., .14 inch.

♂. Last ventral not impressed.

♀. Last ventral with a small fovea near the apex.

Slightly variable in appearance, accordingly as the darker or paler scales prevail.

Hab.—Illinois, Kansas, Nevada, Dakota (collection of H. Ulke), Montana (Dr. Horn).

M. interstitialis n. sp.—Very similar in form and size to the preceding, and easily confounded with it. Dark piceous, densely covered with scales of the same color; beak stout, flattened and much broader at base than at apex; rather strongly declivous and compressed from a level with the insertion of the antennæ; the declivous portion with a strongly marked, median carina, becoming more or less evanescent before reaching the base; a lateral ridge beginning at the insertion of the antennæ, but not attaining the base, very evident when viewed laterally, scarcely so, when seen from above; a vague, transverse impression at the base: surface densely scaly; erect, claviform, hairs very conspicuous. Antennæ stout, scape shorter, inserted at a distance from the buccal opening; scrobes, supraorbital ridge and sulcus as in the two preceding species. Head as in *montanus*. Thorax strongly transverse, a trifle less than twice as wide as long, strongly rounded at the sides and feebly constricted at tip, base broadly rounded; surface strongly punctured, in somewhat concentric rows, scales rather large, corresponding to the punctures and interspersed as usual with stout, erect hairs: vittate as in *montanus*. Elytra slightly wider than the thorax, broadly emarginate at base; humeri rounded, sides very slightly, but distinctly narrowed behind the humeri and rather rapidly rounded to apex; striæ strongly impressed, punctures large, distant, not concealed by the scales; interstices alternately wider and more convex, each with a row of moderately long and stout setæ; humeral spot and scutellum white; a stripe of paler scales commencing at the humerus and becoming evanescent beyond the middle. Under surface as in the preceding

species. Legs stout, especially tibiæ, which are shorter than in *montanus;* femora not annulated; tarsi as in *montanus.* Length 3.5 mm.; 14 inch. Plate I, fig. 7.

The last ventral segment is not impressed in either sex. A very distinct species.

Hab.—Oregon. Six specimens in Dr. Horn's collection.

HORNII Group.

The two species contained in this group are aberrant in form and differ in several important characters from other members of the genus. They are readily recognized by their stout, compact form, very coarse sculpture and the dissimilarity of the sexes. The males are ovate, the elytra attaining their greatest widths behind the middle. The females are broadly oblong; they are black, densely covered with dirty, grayish brown, or piceous scales. They are separated as follows:

Larger.—Thorax channeled and constricted at apex.....**Hornii.**
Smaller.—Thorax not channeled, gradually narrowed to tip.....**setiger.**

M. Hornii n. sp.—Stout, black; antennæ, apex of tibiæ and tarsi rufous. Rostrum: Male slender, cylindrical, longer than the thorax, moderately dilated at apex and slightly curved; median carina entire, distinct, lateral ones almost obsolete, confluently punctured, sparsely scaly. Scrobes sharply defined, directed toward lower half of the eyes; absence of superciliary ridge and sulcus. Female broader and stouter, not longer than the thorax, somewhat depressed, not widened at tip, strongly tricarinate, upper margin of antennal grooves very prominent, giving the appearance of a second lateral carina, which is continued above as a superciliary ridge; quadrisulcate, outer sulci deeper; antennal grooves directed against the upper half of the eyes; supraorbital sulcus evident. Antennæ: scape long, suddenly and strongly incrassate at the apex. Funicle: second joint a trifle longer than first; third to seventh gradually becoming wider; last one subcontiguous to the club, which is broadly elliptical. Head slightly convex, separated from the beak by a transverse impression. Thorax: Male scarcely one-half wider than long, slightly wider at base than apex; sides almost straight and divergent for two-thirds their length, then suddenly narrowed to and broadly constricted at apex; the constriction continued above as a transverse impression; a sharply impressed, median sulcus and a vague impression each side about the middle; surface confluently, but not deeply cribrate. Female transversely, subquadrate; hind angles rounded, sides very slightly and broadly emarginate, otherwise as in the male. Elytra: Male slightly wider at base than the prothorax, subventricose; sides broadly rounded, widest behind the middle, then rather rapidly narrowed to tip; broadly grooved with large foveiform punctures, subconfluent or very narrowly separated; interstices narrow, convex; each with a row of long, very stout, club-shaped setæ, most conspicuous on the convexity; a humeral spot, scutellum and a few scattered spots along the inflexed portion and on the convexity of whitish scales. Female distinctly wider at base than the thorax; oblong oval, not wider behind the middle, otherwise as

in the male; setæ less stout. Beneath sparsely covered with dirty gray scales; coarsely punctate, except last three ventral segments, which are densely and finely punctate. Legs stout, femora strongly clavate, with a conspicuous ring of white scales near the middle; tibiæ stout, feebly unguiculated; some pale scales near the extremity; tarsi scarcely dilated; last joint moderate, pubescent beneath; anterior ones very little wider than middle and posterior. Length, ♂ 4 mm.; .16 inch; ♀ 4.5–5 mm.; .18–.20 inch. Plate I, figs. 8, 9.

It is with pleasure that I dedicate this very interesting species to my learned friend, Dr. Horn, to whom I am indebted for substantial additions to my cabinet, as well as kind advice in the preparation of this paper.

Hab.—Georgia, Florida. Two males and two females in Dr. Horn's collection and a ♀ (?) in Dr. Hamilton's

M. setiger n. sp.—Male; very similar in form and appearance to *Hornii*, from which it differs as follows; smaller size—beak stouter, not longer than thorax, distinctly tricarinate; thorax transverse, more than one-half wider than long, sides broadly rounded, not constricted at tip; disc not channeled, obscurely impressed in front of scutellum and behind anterior margin. Elytra same form as in the preceding species, but setæ much more slender, scarcely conspicuous. Length 3 mm.; .12 inch. Plate I, fig. 10.

A specimen of what I consider the ♀ of *Hornii* in the same collection, is a trifle smaller and has the elytral setæ more slender, as in Dr. Horn's specimen, agreeing, however, in all particulars with the latter; this may possibly be the ♀ of the present species. The scarcity of specimens does not permit me to decide this point.

Hab.—Florida. A unique specimen in Dr. Hamilton's collection is before me.

DELUMBIS Group.

The species belonging to this and the following groups are at once recognized by the rostrum becoming stouter and shorter, and always distinctly carinate above. They alone constitute the genus Macrops sensu Kirby.

In the present group the posterior tibiæ of the males are fringed with long, flying hairs along the inner margin; the thorax coarsely sculptured.

In this and the following group the antennal grooves expand toward their distal extremity and impinge against the upper part of the eyes; their superior margin being directed toward the upper extremity of the eye runs almost parallel with the upper surface of the beak, the latter being always separated from the head by a distinct, transverse furrow.

The two species constituting the present group are distinguished as follows:

Larger, thorax densely and coarsely punctate; elytral punctures smaller.
delumbis.

Smaller, thorax not very densely, cribrate-punctate; elytral punctures larger.
subcribratus.

M. delumbis Gyll.—Elongate, piceous, rather sparsely covered with pale scales; beak moderately stout, shorter than the thorax, slightly widened toward the apex; tricarinate, median carina more prominent; longitudinally rugoso-punctate, separated from the front by a transverse groove: sparsely clothed like the head with yellow filiform scales and four rows of short, suberect setæ. Head transverse, subconvex, densely and finely punctate, each puncture bearing a short, scale-like hair; a supraorbital ridge and sulcus. Thorax subquadrate, slightly narrowed at apex and less than one-half wider than long; sides broadly rounded, not constricted at tip; coarsely and confluently punctate, each puncture bearing a short, yellowish hair; median vitta generally obsolete, lateral one distinct, of whitish scales. Elytra one-half wider than the thorax; parallel for two-thirds, then gradually narrowed to and conjointly rounded at tip. Striæ fine, punctures moderate, rather distant; interstices scarcely convex, third, fifth and seventh a trifle more so, alternately with a row of rather long, slender and somewhat clavate setæ. Beneath glabrous, densely and coarsely punctured, each puncture bearing a short seta. Legs not stout, femora moderately clavate, infuscate about the middle. Tibiæ slender; posterior ones of the male with a brush of long flying hair. Tarsi with the third joint deeply bilobed, almost twice as long as the preceding; last joint slender, as long as the others combined; anterior and middle tarsi moderately dilated, posterior ones narrow, slender. Length 3.5–4.5 mm.; .14–.18 inch. Plate I, figs. 11, 11*b*.

♂. Last ventral segment transversely impressed, rarely a well marked fovea.

♀. Last ventral with a large, oval or subquadrate, profound fovea.

A very variable species. The appearance varies from grayish white to dark piceous.

Hab.—Specimens are before me from Pennsylvania, Iowa, Northern Illinois, District Columbia, Montana, Nevada, Nebraska.

M. subcribratus n. sp.

Differs from the preceding species by its smaller size; the thorax coarsely cribrate; elytral punctures larger, as wide, or even wider than the interstices. Length 3.5 mm.; .14 inch.

Two specimens, males, one in Mr. Ulke's collections and one in my own are before me; the last ventral has a large quadrate impression.

Hab.—Florida.

SPARSUS Group.

In this group the rostrum becomes quite stout and relatively short, more or less distinctly angulated at the sides. Scape of antennæ impinging against the upper part of the eye; supraorbital sulcus always present. The thorax is very densely and finely punctate; has, however, with the scaly vestiture intact, a finely granular appearance. Legs at least moderately stout; tibiæ not denticulate within. Tarsi less slender, anterior of the male with the third joint dilated, deeply bilobed.

The species are closely related and difficult to differentiate; the following table will assist the student in identifying them:

Larger, alternate elytral interstices with a row of setæ; each elytron subacuminate at apex.
Somewhat broader and stouter, densely scaly, unicolorous; tarsi wider. **sparsus.**
More elongate; elytra ferruginous, almost glabrous; tarsi narrower. **longulus.**
Smaller, each elytral interstice with a row of setæ; elytra not subacuminate at apex.
Thorax strongly rounded at base and sides; suborbicular, hind angles obsolete. **rotundicollis.**
Thorax feebly rounded at the sides; hind angles distinct, base subtruncate.
Stouter, elytral setæ very conspicuous..... **obscurellus.**
Slender, elytral setæ inconspicuous..... **imbellis.**

M. sparsus Say.—Elongate-elliptic; piceous, black; above and underside of prothorax rather densely covered with dirty gray or brownish scales, larger and imbricate on the elytra, intermixed with stout, erect hairs on rostrum, head and thorax. Antennæ, tibiæ and tarsi reddish. Rostrum stout, subangulated at the sides; tricarinate, median carina strongly prominent, lateral ones less so; surface with fine longitudinal rugæ or striolate; transverse sulcus very pronounced; scrobes short, ill defined posteriorly. Head convex, very short, transverse, finely rugulose-punctate and like the beak, sparsely clothed with yellowish, squamiform hairs. Thorax wider than long, scarcely narrower at apex than at base; sides broadly rounded, with a vague impression at the middle, apex feebly constricted; transversely impressed in front and a median indistinct groove, lobes feeble; surface densely and finely punctured, generally concealed by the scales; median vitta generally obsolete, lateral ones variable, flexuose. Elytra about one-fourth wider than the thorax, slightly emarginate at base; humeri rounded, sides subparallel for two fifths their length, then gradually narrowed and compressed toward the tip, each elytron distinctly acuminate; striæ rather fine, punctures large, subquadrate when denuded of this scaly covering, but appearing small and remote, or completely concealed, with the vestiture intact; interstices slightly convex, very finely punctulate, alternate ones on the disc with a row of setigerous punctures; setæ long, slender, slightly clavate and rather conspicuous; alternate intervals more elevated; sides and declivity mottled

with paler spots; humeral spots and scutellum white. Abdomen glabrous, finely punctate, each puncture bearing a short, white hair. Legs moderately long and slender; third joint of anterior tarsi dilated, much wider than posterior tarsi in the ♂. Length 4.5–5 mm.; .18–.20 inch. Plate I, fig. 12.

♂. Last ventral not impressed.

♀. Last ventral transversely concave.

M. lineatulus Say, is the form, densely covered with grayish scales, completely concealing the punctures, and the thoracic furrows more distinct.

Hab.—Eastern and Western States.

M. longulus n. sp.—Closely resembling the former in size and form, from which it differs as follows: Body piceous black. Antennæ, elytra and legs ferruginous; glabrous, with a few inconspicuous scales. Thorax rounded at the sides, not impressed, median groove absent, more distinctly transverse than in *sparsus;* punctures a trifle finer.

♂. As in *sparsus*

♀. Last ventral with a large, transverse fovea.

A very distinct species, easily recognized by its shining, ferruginous elytra. It might be confounded with abraded, immature specimens of *sparsus*, when the above characters will determine the species.

Hab.—Dakota (Dr. Horn), Wyoming (Butler). Three specimens.

M. rotundicollis n. sp.—Oblong, black; antennæ, tibiæ and tarsi fuscous, clothed with dark piceous scales. Rostrum as in the preceding species; as wide as the head, subsulcate. Prothorax transversely suborbicular, base and sides equally rounded, hind angles obsolete, feebly constricted at tip; moderately convex, surface finely and densely punctate; an obscure median line and sides whitish, latter enclosing an oblong, dark spot. Elytra scarcely one-third wider than the thorax and strongly emarginate at base, imperceptibly narrowed for three-fourths their length and rather rapidly rounded to the apex, latter scarcely compressed. Striæ broad, feebly impressed, with large, subquadrate, approximate punctures, latter about as wide as the interstices and not concealed by the scales; interstices a trifle convex, alternate ones slightly more elevated toward the base, each bearing a row of slender, not very conspicuous setæ. The scales are rather large and appear to be matted together; when removed the surface is very shining; scutellum, humeri and a few irregular spots near the convexity whitish. Underside coarsely punctate; pectus moderately covered with scales. Legs and tarsi similar to the preceding species; anterior tarsi of ♂ less dilated. Length 4 mm.; .16 inch. Plate I, fig. 13.

♂. Last ventral segment faintly impressed.

♀. Apex of last ventral segment deeply and sharply foveate, emarginate.

Hab.—Texas. Five specimens; Dr. Horn and Mr. Ulke's coll.

M. obscurellus n. sp.

Very similar to and easily confounded with the foregoing, from which it differs in the form of the thorax, which has the base subtruncate, hind angles rather distinct; sides almost straight and slightly divergent from base to middle, latter subangulate. Elytra feebly emarginate at base. Length 4 mm.; .16 inch.

♂ as in *rotundicollis*.

♀. Last ventral with a broad, transverse excavation, not emarginate.

Hab.—Texas, District Columbia (Ulke).

M. imbellis n. sp.—Narrower, elongate; piceous brown, sparsely and irregularly clothed with silvery whitish scales. Antennæ and legs ferruginous. Rostrum stout, subangulate at the sides, strongly tricarinate, median carina more prominent toward the base; distinctly narrower than the head, from which it is separated by a pronounced, transverse impression, thinly covered with scales, intermixed with very short, erect hairs; surface finely rugulose. Head distinctly wider than the beak at base, very short, transverse and flattened; punctate and thinly covered with very small, whitish scales and a few erect hairs. Thorax as long as wide; base slightly rounded and wider than the apex; hind angles rectangular, sides almost straight, subparallel for three-fourths their length, then rounded to apex, latter broadly, but not strongly constricted; sides indented at the middle; surface slightly convex, finely and densely punctate, sparsely squamose; a median and a ʃ shaped lateral vittæ of white scales. Elytra about one-fourth wider than the thorax, oblong; base feebly emarginate; sides somewhat, though very feebly rounded, gradually narrowed and conjointly rounded at tip. Striæ broad, rather strongly impressed, giving almost a subsulcate appearance, punctures well marked, not very close; interstices convex, alternate ones slightly more prominent toward the base, each with a row of short, erect setæ, more closely placed and more evident on alternate interspaces; surface scaly in irregular patches and spots, somewhat shining. Beneath, pectus covered with grayish scales. Abdomen glabrous, densely punctate, each puncture bearing a short hair. Legs rather slender; anterior tarsi of ♂ stouter and broader than middle and hind tarsi. Length scarcely 4 mm.; .15 inch. Plate I, fig. 14.

♂. Last ventral longitudinally impressed.

♀ ?. Last ventral with a round, foveiform impression.

Hab.—Louisiana, Washington Territory. Two specimens from widely different localities in Mr. Ulke's collection.

HIRTELLUS Group.

The species of this group are distinguished by the scape of the antennæ impinging against the middle, or lower part of the eye; the elytra slightly narrowed from the humeral angle, each interstice with a row of strongly marked setæ. They are densely clothed with yellowish brown scales and resemble each other very strongly.

They are separated as follows:

Head scarcely convex between the eyes; transverse impression at base of rostrum very distinct.

Elytral interstices more convex, setæ stouter, more approximate; tarsi less elongate..... **hirtellus.**

Elytral interstices less convex, setæ more slender; tarsi longer..**echinatus.**

Head strongly convex, transverse basal impression almost obsolete...**obtectus.**

M. hirtellus n. sp.—Oblong, moderately stout, rufopiceous, densely covered above with dark piceous scales, mottled on the elytra with pale, brownish spots. Rostrum stout, subangulate at the sides, slightly shorter than the thorax; narrowed from base to the insertion of the antennæ and moderately dilated at tip, strongly tricarinate, median carina entire, spaces between the carinæ and the lateral margin subsulcate, each with a row of approximate, erect, stout, club-shaped bristles; surface longitudinally rugose, thinly clothed with fine squamiform hairs. Scrobes profound, directed toward lower half of the eyes. Head short, trapezoidal, scarcely convex, densely punctate and rather densely clothed with yellow, filiform scales; supraorbital sulcus very distinct, separated from the beak by a broad, slightly curved sulcus, the upper edge of which is rather sharply elevated and fringed with stout, erect hairs like those of the beak. Thorax about one-half wider than long, subconvex; sides broadly rounded; apex not constricted, narrower than the base; surface densely and coarsely punctate, punctures completely concealed by the scaly vestiture, latter intermixed with stout, erect, club-shaped hairs; median vitta and sides pale, latter enclosing an oblong, dark spot. Elytra one-third wider than the thorax, slightly narrowed from humeral angle to three-fifths their length, thence gradually narrowed to and conjointly rounded at tip, latter very slightly compressed. Striæ well impressed, punctures large, not closely placed; interstices scarcely wider than the punctures, moderately convex, when deprived of scales, but subcostiform with the latter intact, each with a row of stout, conspicuous, closely placed setæ which are semiprocumbent on the disc, but erect on the convexity; scutellum, humeral spots, three transverse, ill defined bands and a few scattered, smaller spots, pale. Underside densely punctured, hirsute, pectus sparsely covered with small, dirty gray scales. Legs moderately stout; tarsi moderately long. Length 3.75–4 mm.; .15–.16 inch. Plate I, fig. 15.

♂. Last ventral not impressed.

♀. Last ventral segment with a small, round fovea near the apex.

Hab.—New Mexico, Arizona.

M. echinatus n. sp.—Broadly oblong, rufopiceous, not very densely covered with grayish white or yellowish brown scales, which are especially large on the elytra. Rostrum stout, broad, subparallel, shorter than the thorax, slightly rounded at the sides, median carina evident, but feeble; lateral ones obsolete; surface rugulose, thinly clothed with fine filiform scales, and especially near the base, with a few large, round scales, intermixed with numerous, erect, setæ. Head slightly convex, densely punctate, clothed with filiform scales; scarcely wider between the eyes than rostrum at base, separated from latter by a slightly curved sulcus, latter densely scaly. Scape of antennæ attaining the eye about the middle, scrobes less directed inferiorly than in the two preceding species.

Thorax a trifle wider at its greatest width than long and but slightly narrower at apex than at base; sides rounded, indented, in a varying degree, at the middle and transversely impressed near the apex, latter feebly constricted; convex and densely scaly, with scattered, erect, but rather short setæ; a narrow median vitta and sides enclosing a darker spot, paler; lobes rather prominent. Elytra almost one-half wider than the thorax, same form as in *hirtellus*, scarcely emarginate at base; striæ and punctures same as in that species, with the setæ a trifle longer and more slender, all erect. Beneath, pectus scarcely punctured and covered with dirty grayish scales. Abdomen less coarsely punctured, each puncture bearing a short hair; subglabrous. Legs pale rufous, slender; tarsi long and slender, anterior ones of ♂ with third joint dilated. Length 4–4.5 mm.; .16–.17 inch.

♂. Last ventral segment with discal impression.

♀. Last ventral segment with large, quadrilateral concavity; emarginate.

Very similar to the preceding species; the lateral thoracic indentation varies from almost obsolete to a distinct impression, causing the sides of the thorax to appear emarginate; the color also varies from a uniform grayish white to a yellowish brown with distinct thoracic vittæ and the elytra mottled with paler spots.

Hab.—Texas, District Columbia, Michigan, Northern Illinois, Massachusetts, Arizona, Colorado.

M. obtectus n. sp.—Oblong, stouter than *hirtellus*; reddish brown, densely covered above with small, uniformly dirty brown scales, apparently matted together by some animal glue and completely concealing the sculpture. Rostrum stout, shorter than the thorax, as wide at the base as at the apex; median carina distinct, lateral ones obsolete, sides rounded; surface finely punctured, thinly clothed with very small filiform scales and a few very short, erect hairs; there is a very faint indication of a transverse basal furrow. Head broad, very convex, finely punctulate and thinly covered with very small, filiform scales without trace of erect hairs. Thorax as long as wide, base and apex of equal width; sides straight and slightly diverging for three fourths their length, thence narrowed to tip, latter not constricted, but transversely impressed; surface finely and densely punctured, punctures concealed by the scaly vestiture, latter intermixed with very short, erect, scale-like hairs, prothoracic lobes feeble. Elytra like in the preceding species, but distinctly emarginate at base; striæ and punctures concealed by the scales; interstices with a row of stout setæ. Underneath, legs and tarsi as in *hirtellus*. Length 3.75 mm.; .15 inch.

♂. Last ventral with transverse discal elevation.

Hab.—Arizona. A unique specimen in Dr. Horn's collection.

HUMILIS Group.

The species belonging to this group are at once recognized by the fine pubescence with which they are more or less clothed above. This pubescence varies from fine, hair-like to distinctly squamiform. In

all of them the alternate elytral interstices alone are setigerous. The antennal grooves expand greatly at their distal extremity (except *porcellus*), the scape of the antennæ impinges against the middle of the eye (except *porcellus*) and the antennal club is rather more broadly oval than usual. Thorax with a smooth dorsal line (except *myasellus*). The anterior tarsi are shorter and stouter, with the third joint distinctly dilated in the ♂.

The species are closely related and difficult to separate; the following table, supplemented by the description, will, I hope, enable the student to identify them:

Thorax not carinate, pubescence uniform, cinereous, hair like .... **myasellus.**
Thorax carinate, at times very indistinctly.
Humeri very prominent, rounded and subangulated posteriorly; pubescence coarser.
General appearance light colored; thorax scarcely wider than long. **mirabilis.**
General appearance darker; thorax distinctly wider than long. **vittaticollis.**
Humeri less prominent, rounded, not subangulated behind; pubescence finer.
Scrobes ill defined and expanded posteriorly.
Thoracic carina broader, irregular, abbreviated before and behind.
Densely pubescent, subopaque..... **humilis.**
Pubescence very sparse, shining ..... **anthracinus.**
Thoracic carina entire, linear..... **californicus.**
Scrobes sharply defined, only moderately widened posteriorly.. **porcellus.**

M. myasellus n. sp.—Oblong, moderately stout, blackish. Antennæ, legs and sixth elytral interspace rufous, uniformly clothed above and beneath with grayish, fine hair-like pubescence. Rostrum stout, not wider at base than apex, slightly convex and strongly tricarinate, median carina prolonged and ending in a frontal puncture, transversely impressed at base. Head convex, as wide between the eyes as rostrum at base, and, like the latter, punctured and finely pubescent. Scape of antennæ gradually thickened, rather short and directed against the middle of the eye; antennal grooves wide, superficial and pubescent in their whole length. Thorax one-half wider than long, slightly convex, a trifle wider at base than at apex; sides regularly rounded, apex feebly constricted and transversely impressed; lobes feeble; there is a slight emargination in the middle of the anterior thoracic margin; surface confluently rugulose-punctate, pubescent, sparsely covered at the sides with pale scales and some scattered scales on the disc. Elytra about one-fourth wider than thorax at middle; emarginate at base, humeri rounded, very slightly narrowed for about three-fourths their length, thence gradually narrowed to and rounded at apex. Striæ impressed, punctures moderate, approximate; interstices wide, flattened, alternate ones with rows of distant, setigerous punctures, setæ very slender, moderately long, inconspicuous, sixth interspa e from near the base to the posterior callus rufous; surface finely pubescent; scutellum, base of sixth interspace and a few scattered

scales along the base white. Beneath, pectus thinly clothed with dirty gray scales; surface densely and coarsely punctate, each puncture bearing a short, stout, seta. Legs moderately stout, rufous, femora infuscate about the middle. Length 4.5 mm.; .18 inch.

♂. Last ventral feebly impressed near the apex.

A unique, badly preserved specimen in my own collection is labeled South Park, Colorado. A very distinct species, easily recognized by its uniform gray pubescence. The rufous color of the sixth elytral interstice may be due to immaturity.

M. mirabilis n. sp.—Stout, oblong, piceous, variegated above with white and pale, fawn colored scales, pubescence yellowish, having a brassy lustre; beak stout, wider at base than apex, almost as long as the thorax; somewhat convex, median carina feeble, lateral ones indistinct; transverse basal impression obsolete; sparsely clothed with large white scales and coarse, yellow pubescence, directed transversely and intermixed with very short, stout, suberect hairs. Head broadly trapezoidal, wider than the rostrum at base, subconvex, an obscurely elevated ridge between the eyes; front flattened, sparsely scaly; occiput clothed with short pubescence. Thorax as long as wide at the base, latter distinctly wider than the apex; moderately convex; sides broadly rounded, apex broadly, but not strongly constricted; surface densely punctate, obliquely impressed in front, carina very fine, linear, almost concealed by scales and somewhat abbreviated at either end. Scales large, round, white, covering the sides rather densely, a row each side of the carina and sparsely scattered on the disc, pubescence long, coarse. Elytra more than one-half wider than thorax at its base, slightly emarginate at base; humeri prominent, rounded and subangulate behind, sides parallel for almost three-quarters their length, rather rapidly rounded to apex; striæ impressed, punctures large, approximate; interstices wide, flat, alternate ones with a row of rather distant, slightly clavate setæ, shorter on the convexity; sides and convexity densely squamose, white and light fawn colored; disc, except triangular basal space and first interstice, variegated with white spots; scutellum and humeri covered with cream colored scales, spaces not covered by scales, are clothed with very fine, appressed, scale-like pubescence. Underside densely punctate, each puncture bearing a squamiform hair, which, however, become broader and true scales on the thorax; side pieces of latter and prothorax, densely scaly. Legs rufopiceous. Length 4.5 mm.; .18 inch.

Hab.—Illinois. A single specimen of this very pretty species in Mr. Ulke's collection is before me. It appears to be a female, and has the last ventral slightly concave.

M. vittaticollis Kirby.—Very similar to the preceding species, but a trifle stouter, differs as follows: beak distinctly tricarinate, median carina prominent, entire and ending in a frontal puncture; transverse basal impression distinct; less coarsely pubescent, not scaly. Thorax transverse, more than one-half wider than long, strongly rounded at the sides, apical constriction strong, but narrower; median and lateral vittæ sharply defined, rest of surface coarsely pubescent, with scattered scales; median carina entire or nearly so. Elytra less than one half

wider than base of thorax, sides and convexity less densely scaly, inflexed portion covered with scaly pubescence; scales light brown, a few subquadrate spots and some fasciaform patches of the convexity, of whitish scales; scaly pubescence reddish brown, having a somewhat cupreous lustre, and is especially dense along the suture. Underside, legs and tarsi same as in *mirabilis*. Length 5 mm.; .20 inch. Plate I, fig. 16.

♂. Apex of last ventral segment flattened, scarcely impressed.

♀. Last ventral with large, quadrate, sharply defined fovea, extending whole length of segment, but not emarginate.

Hab.—Wyoming, Nebraska. Stouter and of darker color than the preceding species.

M. humilis Gyll.—Smaller and narrower than *rittaticollis*, which it resembles, and to which it is very closely related; beak longer and less stout, a trifle wider at apex than at base and almost as long as the thorax, latter less transverse and less than one-half wider than long, sides less rounded, median carina broader, irregular, and generally abbreviated at either end, never concealed by scales; an obscure fovea in front of scutellum, covered with whitish scales; median vitta absent; pubescence of head, rostrum and thorax much finer, grayish white, rarely of metallic lustre. Elytra: humeri less prominent, rounded and not subangulate posteriorly; scaly pubescence much finer and less dense, whitish, slightly metallic in scutellar region and along the suture; scales whitish. Length 4–4.5 mm.; .16–.18 inch.

♂. Same as in *vittaticollis*.

♀. Last ventral segment with a large subquadrate, but not sharply defined fovea.

M. maculicollis Kirby, is a variety, with the lateral thoracic vitta obsolete in its anterior half, thereby giving the appearance of three basal spots.

Hab.—Eastern and Western States.

M. californicus n. sp.—Elongate-elliptical; dark piceous, densely clothed above with brown and rather coarse pubescence. Rostrum stout, subconvex, tricarinate; median carina prominent, entire, lateral carinæ abbreviated anteriorly and not very evident, rugulose-punctate; finely pubescent, transversely impressed at base. Head convex, slightly wider than rostrum at base and densely pubescent. Thorax a trifle wider than long, apex scarcely narrower than the base; sides regularly and broadly rounded, apex feebly constricted, anterior margin slightly rounded. Surface densely punctate, obliquely indented each side in front and very obscurely impressed at the sides; median elevated line very fine, linear; disc clothed with rather coarse, yellow pubescence, side and antescutellar spot with whitish scales; a dark, lateral thoracic spot, visible when viewed from above. Elytra about one-third wider than the thorax, slightly emarginate at base, humeri prominent, rounded, sides subparallel for two-thirds, then gradually narrowed to and rounded at tip, latter slightly compressed. Striæ well impressed, with longitudinal, approximate punctures; interstices flat, setæ short, slender and inconspicuous; pubescence rather coarse, dense, scale

like, and has a brassy lustre; a stripe extending from humerus to posterior callus and some scattered spots on disc and convexity of grayish white scales. Underside semiglabrous, pectus rather densely clothed with gray scales. Legs rufopiceous, femora infuscate at middle. Length 3.75–4 mm.; .15–.16 inch.

♂. Apical half of last ventral impressed, emarginate.

♀. Last ventral with a large, subquadrate fovea, not emarginate.

Hab.—California, Washington Territory (Dr. Horn), Oregon (Ulke). A very distinct species.

M. anthracinus n. sp.—Oblong, shining black, very sparsely pubescent. Antennæ and feet rufous; rostrum stout, subquadrate, almost as long as the thorax, strongly tricarinate; apex a trifle wider than at base. Surface coarsely rugose-punctate, each puncture bearing a short hair, transverse basal impression profound, with a strongly marked central fovea; antennal grooves sharply pointed, very much expanded posteriorly and attaining the anterior margin of the eye in almost its whole extent. Head subconvex, a trifle narrower between the eyes than rostrum at base, coarsely punctured and very sparsely pubescent. Thorax one-half wider than long, convex, scarcely wider at base than at apex; sides almost straight and slightly divergent for three-fourths their length, rather suddenly rounded to and broadly constricted at tip. Surface very coarsely punctate, sides and along anterior margin more densely and less coarsely; obliquely indented each side in front, indentation reaching the median line; pubescence fine, scale like, a curved lateral line and an antescutellar spot of white scales; median carina strongly marked, commencing behind anterior margin and extending about two-thirds the length of thorax, becoming slightly broader and more elevated posteriorly; lobes very prominent. Elytra one-half wider than thorax at base; sides subparallel for two-thirds rather rapidly narrowed to and rounded at tip, latter not compressed. Striæ more strongly impressed on the convexity, punctures large, transverse and closely set; a distinct transverse indentation near the base extending from second to fourth interstice; interspaces slightly convex, finely punctulate; setæ slender, more evident along the convexity, latter more strongly pronounced than usual; posterior callus small, but distinct; pubescence very fine, sparse; a few irregular, ill defined spots of pale, inconspicuous scales. Underside shining, sparsely punctured and pubescent, except on the thorax. Legs shining, sparsely pubescent. Length 3.5–4 mm.; .14–.16 inch.

Easily recognized by its black, shining appearance and coarse sculpture.

The last ventral segment is broadly impressed in both sexes.

Hab.—Florida. Dr. Horn's and Mr. Ulke's collections.

M. porcellus Say.—Similar in form and appearance to *humilis*, but smaller, pitchy black, shining, thinly pubescent. Antennæ bright rufous; beak rather slender, almost as long as the thorax, tricarinate, rugulose-punctate, thinly clothed with not very fine, grayish pubescence; basal impression feeble; antennal grooves sharply pointed in their whole extent and less expanded toward their distal extremity, scape of antennæ impinging against upper part of eye. Head convex, slightly wider than rostrum at base, densely punctulate and finely pu-

bescent. Thorax subquadrate, about as long as wide at the base, latter slightly wider than the apex; sides broadly rounded from base to apex, latter feebly constricted; surface densely punctured, punctures small, each bearing a fine, short hair, transversely impressed near the anterior margin and a feeble impression in front of the scutellum; smooth median line not elevated, abbreviated before and behind; sides clothed with small, dirty white scales. Elytra one-half wider than thorax at base. Striæ impressed, punctures large, transverse and closely approximate; interstices moderately convex, scarcely wider than the punctures; setæ long and slender, erect, but not very conspicuous; pubescence very fine, sparse and easily removable, variegated with irregular spots of white scales. Underside densely and coarsely punctured, each puncture bearing a short, scale-like hair, those of prothorax and side pieces of meso- and metathorax more dense and squamiform and having a greenish reflection. Legs varying in color from bright rufous to piceous black. Length 2.75–3 mm.; .11–.12 inch.

♂. Last ventral scarcely impressed.

♀. Last ventral with variable, never profound fovea.

Easily recognized by its small size. Might be confounded with small specimens of *humilis*, from which it differs by its longer and more slender beak, narrow and sharply defined scrobes and the thorax, being scarcely wider than long.

Hab.—Middle and Western States.

LIST OF SPECIES.

MACROPS Kirby.

1. M. solutus Boh., Sch. Curc. vi. 2d, 197.
2. M. indistinctus n. sp.
   Listr. spurcus Boh.? Sch. Curc. vi 2d, 196.
3. M. cryptops n. sp.
4. M. hyperodes n. sp.
5. M. nevadensis n. sp.
6. M. grypidioides n. sp.
7. M. Wickhami n. sp.
8. M interpunctatulus n. sp.
9. M. Ulkei n. sp.
10. M. dorsalis n. sp.
11. M. tenebrosus n. sp.
12. M. alternatus n. sp.
13. M. montanus n. sp.
14. M. interstitialis n. sp.
15. M. Hornii.
16. M. setiger.
17. M. delumbis Gyll., Sch. Curc. ii. 283.
18. M. subcribratus n. sp.
19. M. sparsus Say, Curc. ii. ed. Lec. i. 271; Gyll., Sch. Curc. ii. 283.
    Listr. squalidus Gyll., ibid. ii. 181.
    Listr. lineatulus Say, Curc. ii. ed. Lec. 272; Boh., Sch. Curc. vi. 2d, 195.
20. M. longulus n. sp.
21. M. rotundicollis n. sp.
22. M. obscurellus n. sp.
23. M. imbellis n. sp.
24. M. hirtellus n. sp.
25. M. echinatus n. sp.
26. M. obtectus n. sp.
27. M. myasellus n. sp.
28. M. mirabilis n. sp.
29. M. vittaticollis Kirby, Fauna Bor. Am. iv. 200.
30. M. humilis Gyll., Sch. Curc. ii. 284.
    M. maculicollis Kirby, Fauna Bor. Am. iv. 200, pl. 8, fig. 4.
31. M. anthracinus n. sp.
32. M. californicus n. sp.
33. M. porcellus Say, Curc. ii. ed. Lec. i. 271; Gyll., Sch. Curc. ii. 284.

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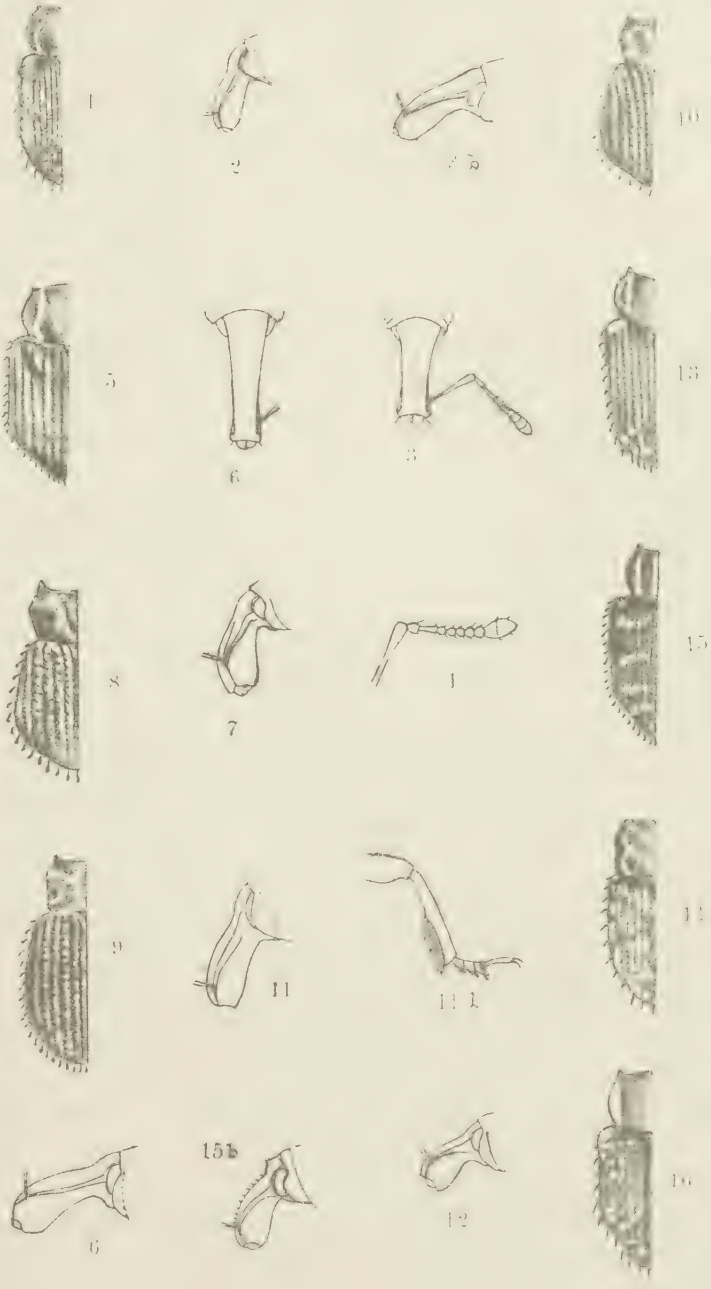
Unrecognized Species.

1. M. spurcus Boh.? Sch. Curc. vi. 2d, 196.
2. M. immundus Boh., Sch. Curc. vi. 2d, 198.

EXPLANATION OF PLATE.

1. Antenna of *M. solutus.*
2. Lateral view of head of *M. cryptops.*
3. Head and antennæ of *M. hyperodes;* 3*b*, Head of same seen laterally.
4. *M. nevadensis.*
5. *M. Ulkei.*
6. Front view of head of *M. dorsalis;* 6*b*, same seen from the side.
7. Side view of head of *M. interstitialis.*
8. *M. Hornii* ♂.
9. " ♀.
10. *M. setiger* ♂.
11. Lateral view of head of *M. delumbis;* 11*b*, posterior tibia of ♂ of the same.
12. Lateral view of head of *M. sparsus.*
13. *M. rotundicollis.*
14. *M. imbellis.*
15. *M. hirtellus:* 15*b*, head of the same seen from the side.
16. *M. vittaticollis.*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Contributions to a knowledge of the LEPIDOPTERA of West Africa.

BY REV. W. J. HOLLAND, D.D., PH.D.

PAPER II.

List of African SPHINGIDÆ received during the years 1887 and 1888.

It requires some degree of assurance on the part of the student to publish a species as new to science when he reflects upon the manner in which the earth has been scoured in every direction by ardent collectors in quest of the curious and the beautiful in nature. The dark forests and grassy prairies of equatorial Africa are, however, as yet to some extent a *terra incognita* to the entomologists of the world, and they teem with the most beautiful and curious forms of insect life. It is from this region that the species described in the following paper have come, and I am indebted for the specimens upon which my descriptions are based to the Rev. A. C. Good, of the American Presbyterian mission at Gaboon, and to Mrs. Louise Reutlinger, of the same mission, who was stationed during her stay in the country at Benita. The specimens collected by Mr. Good were taken principally at Kangwé, upon the banks of the Ogové River, about 165 miles from its mouth. Kangwé is only two or three miles from the Equator. Benita is a mission station upon the coast about 110 miles north of the Equator.

In studying the specimens before me I have availed myself of all the literature upon the subject accessible to me, yet regret that I have been unable to consult one or two papers by the Dutch entomologists which treat of the African Heterocera. I am under special obligations to Mr. Arthur G. Butler, F.L.S., F.Z.S., and Mr. Herbert Druce, F.L.S., F.Z.S., for invaluable assistance most freely and courteously extended to me in the determination of some of the species named in this paper. Their opinion that what I have ventured to describe as species new to science are such indeed, has greatly encouraged me in venturing upon the publication of the following pages.

SPHINGIDÆ.

Subfamily MACROGLOSSINÆ.

Genus **MACROGLOSSA** Ochs.

1. **Macroglossa trochiloides** Butl., P. Z. S. 1875, p. 5, No. 6; Trans. Z. S. London, vol. ix, p. 525.

This species was originally described by Mr. Butler from specimens received from Sierra Leone. I have received specimens both from the Ogové and from Benita. It is a common West African insect.

2. **Macroglossa Falkensteinii** Dewitz, Mitth. d. Münch. Ent. Vereins. 1879, p. 24.

I am indebted for the identification of this beautiful species to Dr. H. Dewitz, of Berlin, who, with the most distinguished courtesy, presented me with the original drawings from which the plates illustrating his article in the Transactions of the Munich Society were made.

Hab.—Benita (Reutlinger), Kangwé (Good).

Genus **HYPÆDALEA** Butler.

3. **Hypædalea insignis** Butl., Trans. Ent. Soc. London, 1877, pp. 397-98. Plate ix, fig. 3.

This insect, which Mr. Butler aptly characterizes as "one of the most singular of the *Sphingidæ*, exhibiting affinities to *Lophura*, *Pachygonia*, *Rhodosoma* and *Sataspes*," was described from a specimen in the collection of the Royal Dublin Society which came from Sierra Leone. Since then the British Museum has acquired a specimen from the Cameroons. There is nothing in Mr. Butler's description to indicate the sex of the type. The unique specimen in my collection, which was taken at Benita, is, I think, a female. The antennæ are longer and slenderer than in the figure given in the Trans. Ent. Society, and the body is heavier.

Genus **AELLOPUS.**

4. **Aellopus Commasiæ** Walk., **Pl. II, fig. 1.** *Macroglossa Commasiæ*, Walker, Lep. Het. viii. p. 90, No. 9, 1856. Boisduval, Species Général, *Sphingides* vol. i. p. 357, 1874. *Aellopus Commasiæ*, Butl., Revis. Sphingidæ, Trans. Z. S. London, vol. ix. p. 530, 1876.

Boisduval remarks, "Ce rare et joli Macroglosse se trouve à Commasia,* près de Sierra Leone. Nous l'avons décrit au British Museum sur un individu unique."

* Coomassie?

As no figure of this beautiful little insect has ever been published I give one in order to facilitate the labors of future students. The only specimen in my collection was taken at Kangwé, and is singularly fresh. Whether it is a bred specimen I have no means of determining.

PSEUDENYO gen. nov.

Having a superficial resemblance to the American genus *Enyo* Hüb. The abdomen is relatively shorter than in *Enyo*, broad, somewhat abruptly rounded off behind and flattened on the ventral aspect as in *Aellopus*, *Thyreus* and some other Macroglossine genera. Vestiture of the head, thorax and abdomen smooth, silky, forming a low, narrow crest upon the head between the insertion of the antennæ, and in the male produced in the form of an anal tuft, and lateral pencils upon the sides of the last four ventral segments. In the female the anal tuft and the pencils of hairs upon the sides of the abdomen are wanting or but feebly developed. The palpi are densely clothed with long silky hair, produced, subconic, appressed, very much as in *Lophura*. The antennæ are of medium length, almost uniform thickness throughout, slender and gently recurved at extremity, very minutely toothed in the male, slenderer and entirely without teeth in the female. Legs in both sexes alike, unarmed, except for the usual spurs of the middle and hind tibiæ, the forelegs shorter than the others, with subcylindrical tibiæ, the middle and hind legs with flattened tibiæ and femora.

Primaries relatively of normal length, the apex truncated and slightly excavated, the outer margin very slightly toothed save at the extremity of the disco-central nervule where it is strongly produced. Inner margin of the outer half deeply concave, on the inner half convex.

Secondaries narrow, rounded at apex; anal angle produced, broad, obtuse. Type—*Pseudenyo Benitensis*.

5. **Pseudenyo Benitensis** n. sp. **Plate II, fig. 2.** ♂.

♂.—Upperside of head and body dark rich brown, lower side of palpi, thorax and abdomen tinged with red, shading into faint crimson; an obscurely defined patch of the same red occurs on the side of the fourth segment of the abdomen. Antennæ testaceous, lighter below. Legs of the same general color as lower side of abdomen, spines on tibiæ tipped minutely with white. Upperside.—*Primaries* brown, with a purplish cast, the basal half paler than the rest of the wing, with a somewhat broad shade of brown on the costa near the base, followed by two irregular and somewhat indistinct dark lines running from the costa

obliquely in the direction of the base across the wing. These lines are followed by a lighter shade, which, upon the internal margin becomes pale gray; a broad shade of bluish black sweeps from the middle of the inner margin upward and outward to near the extremity of the discal cell, where it is interrupted by a patch of paler color, in the midst of which is the exceedingly minute white discal spot; beyond this spot the shade of bluish black sweeps outward in the form of an undulating dash, the outer extremity of which rests upon vein seven, the subcosta-postapical nervule; a dark brown submarginal shade runs from the costal margin with diminishing breadth to the internal angle. In the subtriangular patch of lighter color included between the dark median and the submarginal shades appear two indistinct annules of dark brown. At the extremity of the primaries are two dark brown lunules; the *posterior wings* are broadly dark brown with obscure median and submarginal bands of black. The inner margin is broadly orange yellow and the tip of the tooth-like prolongation of the anal angle is white. UNDERSIDE.—*Primaries* dark brown, save on the costa and outer margin, where there are some light pearly gray marks, and at the internal angle, where is a broad subtriangular patch of light red. The *secondaries* have the red shade of the primaries produced across their middle and interrupted by a median and submarginal line of dark brown. Costa and outward margin dark brown.

♀.—Does not differ from male, save in the somewhat lighter tone of the wings and the absence of the pencils or tufts of hair upon the sides and tip of the abdomen. Expanse ♂, 2¼ in.; ♀, 2½ in.

Described from two males and one female in coll. Holland. From Benita (Reutlinger).

EULOPHURA gen. nov.

Head small, slightly retracted under the prothorax; eyes of moderate size. Antennæ less than one-half the length of the costa of the anterior wing, slender, and with a very short hook at the extremity; palpi densely clothed with silky scales, subconic, appressed, moderately produced. Thorax densely covered with a smooth and silky vestiture, patagiæ inconspicuous. Abdomen stout, somewhat flattened on ventral aspect, and in the male provided with a broad fan-shaped anal tuft; anterior wings deeply excised on external and sinuate on internal margins, *not toothed*; inferior wings rounded at apex and slightly produced near the anal angle at extremity of submedian vein, *margins entire*. Type—*E. atrofasciata*.

Species:

Eulophura atrofasciata Holland.
" *sardanus* Boisd.

NOTE.—The genus *Lophura*, originally indicated by Boisduval and adopted by Walker, for a number of years appeared to be a

sort of "refuge for the destitute," and an examination of the insects included under this generic appellation shows that forms widely discordant in structure have been brought together under this name. In the "Revision of the Sphingidæ" by Mr. Butler, the best conspectus from an English authority which has as yet appeared, such widely different forms as *plagiata* Walker, *sardanus* Boisd., and *pylas* Cram., are brought together under *Lophura*. In the "Species Général" Boisduval effected a partial division of the species for the most part originally assigned by himself to the genus. He separates the forms having untoothed anterior wings into a group to which he gives the name *Ocyton;* puts the forms having dentated anteriors by themselves into a genus which he names *Aspledon*, and restricts *Lophura* proper to two small Asiatic forms.* Boisduval is, however, consciously inconsistent in referring his *Sardanus* to *Aspledon*. Walker had classified it with *Enyo*. In locating *Sardanus* in the genus *Aspledon* Boisduval expresses reluctance, and the opinion that a subgenus should be created for its reception. Mr. Butler, to whom I referred a figure of *Atrofasciata*, has assured me that structurally it is very near *Sardanus*, the type of which is in the British Museum I have therefore resolved to do what Boisduval fourteen years ago suggested, and have created the genus *Eulophura*, to which I refer these two allied forms. I hope none of the "irascibile genus" of Lepidopterists will "get mad" at what I have done.

6. **Eulophura atrofasciata** n. sp. **Plate II. fig. 3.**

"Near Sardanus" A. G. Butler *in litt.*

♂. Upperside.—Palpi, head, thorax and abdomen dark brown, shading into reddish on the sides of the abdomen. *Primaries* boldly excised on outer margin below apex, produced inferiorly at external angle and sinuous on inner margin; basal portion lilac gray shaded with brown next to thorax and marked within this shaded part by two obscure transverse lines. A broad band of dark velvety brown crosses the wing obliquely, its inner margin running in an almost straight line from the middle of the costa to the internal angle, its outer margin which is boldly sinuate, reversing the curves of the outer margin of the wing. *Secondaries* uniformly dark reddish brown, fringes narrow, light reddish gray, interrupted with brown at ends of nervures. Anal extremity of the abdomen provided with a conspicuous brush of hairs.

Underside.—Palpi whitish. Thorax and abdomen light brown, tinged with yellow and thorax. Legs reddish gray. *Primaries* dull red, shaded on the discal area with black and tinted with yellow at base of costa. *Secondaries* dull red, shading rapidly from outer margin toward the base into orange yellow. Two exceedingly obscure brown submarginal lines appear on secondaries, and one on the primaries. Expanse of wings 50 mm.

Benita (Reutlinger). Described from one male in my collection.

* The forms since assigned to Lophura are all Asiatic so far as I have observed.

Genus **OCYTON** Boisd.

7. **Ocyton scitula** n. sp. **Plate II, fig. 4.**

UPPERSIDE.—Head, patagiæ and abdomen reddish cinereous, except first segment of abdomen, which is dark brown. *Anterior wings* cinereous, with a lilacine lustre. Markings dark brown, as follows: just before the base two transverse lines distinct on costa, but obscure on inner margin, then a broad, brown shade, sharply angulate near the costa, obsolete on the cell, but very distinct on inner margin; a second broad shade of brown runs from the middle of the costa to the external angle, well defined on the inner margin, but diffuse toward the side of the apex; at the inner angle this shade is preceded by a subquadrate brown spot defined on the side of the external margin of the wing by white; the broad central band of brown is followed toward the apex by three curved brown lines darkest on the costa, and converging to a small white submarginal spot situated between the fourth and fifth veins. A broad lunular shade adorns the outer margin extending from the apex to the angle, which lies midway between the apex and the posterior margin. Fringes of the same color as the body of the wing, exceedingly narrow and very obscurely checkered with lighter color toward the internal angle. *Posterior wings* dark brown, with a very obscure submarginal fascia of vinous red. Fringes narrow, checkered with white on the intra-neural spaces.

UNDERSIDE.—Palpi, thorax and legs ashen gray. Abdomen red, with a white spot on the middle of the edge of the first four abdominal segments. *Anterior wings* cinereous on costa, broadly reddish brown on discal area, bright red on the median area and broadly lilacine on the margin, crossed by a number of obscure lunulate bands of brown; the white spot between veins four and five, and three white spots near the external angle, very distinct. *Posterior wings* red, shading into cinereous at base and testaceous on outer margin and traversed by four narrow and somewhat obscure bands of brown, parallel to the outer margin.

The female does not differ in coloration from the male, and is distinguished simply by her larger size and the absence of teeth on the antennæ. Expanse of wings ♂, 50 mm.; ♀, 54 mm.

Described from two males and one female in coll. Holland.

Hab.—Benita (Reutlinger).

8. **Ocyton lapygoides** n. sp. **Plate II, fig. 5.**

UPPERSIDE.—Head, thorax and abdomen light brown, inclining to red on abdomen and darkest on thorax. *Anterior wings* light reddish gray, traversed by four series of greenish brown lines obsolete on costa, but growing darker and more distinct toward inner margin; a broad brown shade extends diagonally from the middle of the costa to the internal angle, and is followed by two somewhat curved parallel lines, dark and well defined toward costa, and absorbed into the broad diagonal shade at the internal angle. Three minute black dots appear on the outermost of these lines located respectively on veins 4, 5 and 6. The outer margin is adorned by a lunular shade of dark brown extending from just below the apex to the middle of the margin as in *O. scitula*, but narrower than in that species. *Posterior wings* dusky, with a faint submarginal band of red. Fringes narrow, white, checkered with dusky at tips of veins.

UNDERSIDE.—Palpi, thorax and abdomen light reddish gray. *Anterior wings* dusky from base to beyond middle, then crossed by three transverse bands of obscure red lunules, the uppermost of which on the costa shade into whitish gray. Margin broadly lilacine gray. *Posterior wings* red, traversed by a narrow median and submarginal band of brown. Margin narrowly lilacine gray.

The female is somewhat darker in color and the markings more obscure than in the male. Exp. of wings ♂, 46 mm.; ♀, 50 mm.

Described from three males and one female in coll. Holland.

Hab.—Benita (Reutlinger).

9. **Ocyton Reutlingeri** n. sp. **Plate II, fig. 6.**

Nearly allied in form and coloration to *Iapygoides*, but quite distinct. The primaries are not angulate on the outer margin as in the two preceding species, but are evenly convex, and the internal angle is very slightly produced.

UPPERSIDE.—Palpi, head, thorax and abdomen olivaceous. *Anterior wings* olive gray, with exceedingly indistinct, transverse bands in the basal area; an obscure shade of darker olivaceous crosses the wing obliquely from the middle of the costa to the internal angle, and is followed by a broad ashen gray space upon the apical third uninterrupted save by a row of four minute dots situated upon veins 3, 4, 5 and 6. A dark triangular subapical spot is situated upon the costa and a faint lunulate shade is situated upon the outer margin just below the apex. The fringe is white, conspicuously checkered by black at the extremities of the veins. *Posterior wings* uniformly black, with white fringe checkered with black as the anteriors.

UNDERSIDE.—*Anterior wings* reddish gray, broadly shaded with fuliginous on the basal and median area. Two indistinct undulate submarginal lines extend from costa to inner margin. *Posterior wings* uniformly reddish gray, traversed by narrow and well defined median and submarginal lines. Fringes as on upper side. Palpi grayish white. Thorax, legs and abdomen gray. Expanse of wings 42 mm.

Described from a very fresh and perfect male in coll. Holland.

Hab.—Benita (Reutlinger).

10. **Ocyton Eranga*** n. sp. **Plate II, fig. 7.**

Nearly allied in general appearance to *scitula*, the outer margin of the primaries angulate and not convex.

UPPERSIDE.—Head and thorax dark gray, inclining to ferruginous. Abdomen light fawn. *Anterior wings* having at the base a dark transverse shade, succeeded by a band of cinereous, broadest on the cell, bounded internally and externally by lighter lines and traversed through the centre by a geminate line of dark brown. Beyond this a dark shade traversed by two or three darker lines; just before the internal angle a subquadrate dark spot bounded externally by white; a broad band of dark brown as in all the previously described species runs diagonal from the costa to the internal angle and is followed by three undulate lines sharply defined upon the light gray apical tract. Of these lines the outermost consists of a dark subapical costal spot, followed by a row of dark lunules bounded inwardly by grayish white; the subapical lunular shade appears upon the outer

* In the Mpongwé dialect "a beauty."

margin as in *scitula*. Fringe white, checkered with black. *Posterior wings* brown, darkest upon the margin, with an obscure submarginal band of ferruginous. Fringe as in primaries.

UNDERSIDE.—*Anterior wings* smoky gray, with a lilaceous submarginal shade, defined inwardly by a row of yellow lunules extending from the costa to the internal angle and preceded toward the base by a band of ferruginous spots. *Posterior wings* light ferruginous, except on margin, which is broadly lilac gray, preceded by a narrow band of yellowish red lunules; a narrow, median, transverse band and a still narrower and fainter submedian band traverse the wing from the costa to the inner margin. Palpi, thorax and legs ashen white, abdomen tinged with light ferruginous. Expanse of wings 38 mm.

Described from one female in coll. Holland from Kangwé (Good).

This species may be distinguished from *scitula*, which at first sight it resembles, by the absence of the submarginal white spot in the primaries, the more intricate style of the markings and its smaller size.

Subfamily CHÆROCAMPINÆ.

Genus **PANACRA** Walker.

11. **Panacra Saalmülleri** Moeschler, Abhandl. d. Senckenb. Naturf. Ges. Bd. xv. p. 68. Plate I, fig. 23 (1887).

"Very closely allied to my *P. imitans*, which mimics the Malagasy *Chœrocampa Geryon*," A. G. Butler *in litteris*.

Benita (Reutlinger).

Genus **BASIOTHEA** Walker.

12. **Basiothea idricus** Drury. Illustrations, vol. iii. pl. ii, fig. 2 (1793).

I have a number of the bred specimens of the imago and the cast-off pupa cases, but the latter are hardly in such condition as to justify an attempt to frame a description or prepare a figure. They strongly remind me of the pupa of *Chœrocampa tersa*, the common Chœrocampa of the United States.

Benita, Gaboon, Kangwé.

Genus **DIODOSIDA** Walker.

13. **Diodosida fumosa** Walker, Lep. Het. viii. p. 193, No. 3 (1856). *Zonilia fumosa* Boisd., Spec. Gen. Crepusculaires, vol. i. p. 144.

Walker's type was from the Congo, and is in the British Museum. Boisduval based his description upon an example from the Guinea Coast.

Kangwé (Good).

Genus **CHÆROCAMPA** Duponchel.

11. **Chærocampa eson** Cram., Pap. Exot. iii. p. 57, pl. 226, fig. C (1782). Boisduval, Spec. Gén. Crepusc. vol. i, p. 232–33 (1874).

Benita. Six males and females.

15. **C. charis** Walker, Lep. Het. viii, p 136, No. 15 (1856). Boisd., loc. cit. p. 236, plate vi, fig. 4 (1874).

Apparently common at Benita and Kangwé.

16. **C. celerio** Linn., Syst. Nat. i. 2, p. 800 (1766). Cram., Pap. Exot. ii. p. 42, plate xxv, fig. E (1779).

Two fine examples. Benita.

17. **C. balsaminæ** Walker, Lep. Het. viii. p. 138, No 18 (1856). Boisd. loc. cit. p. 232 (1874).

One example. Benita (Reutlinger).

18. **C. irregularis** Walker. **Plate III, fig. 3.**

Pergesa irregularis Walker, Lep. Het. viii. p. 152, No. 4 (1856).

Mr. Butler, in response to my inquiries, after seeing a specimen which I sent him, writes: "It is allied to the Asiatic types of *Pergesa*, but whether it really belongs to that genus, or to *Chærocampa*, I am not prepared to say without a careful comparison of the structure of the two genera. I suspect your localization is more correct, and that it belongs to the *C. clotho* group of the latter genus. Walker's type is in poor condition."

I am a little in doubt as to the correctness of my reference to *Chærocampa*, but with what knowledge I have of the species of *Pergesa*, found in China and Japan, I am unwilling to leave this fly in their company.

19. **C. livida** n. sp. **Plate III, fig. 4.**

Upperside.—Head, thorax and abdomen slaty gray, darkest on the median line between the eyes and on the front of the thorax. Primaries slaty gray, a very obscure angulated band of a rusty brown color crosses the wing just beyond the base; on the inner margin just before the internal angle is a subquadrate spot of the same color; a dark, ill defined shade crosses the wing diagonally beyond the middle of the costa and extends almost to the internal angle; a subapical spot on the costa and two subapical lunules of rusty brown on the outer margin complete the list of the distinctive markings of the primaries. Secondaries uniformly black. The fringes of both primaries and secondaries narrow, white, marked by the dark ground color of the wings at the end of the veins.

Underside.—Palpi, thorax and abdomen lighter in color than upper surface; the first pair of legs is whitish, the middle and hind pair of the same general

color as the adjacent parts of the body. Primaries and secondaries rusty gray, except the discal area of the primaries, which is black; a few faint lines and marks appear on the lighter surfaces. Expanse 70 mm.

Described from two specimens in coll. Holland.

Hab.—Benita (Reutlinger).

NOTE.—I had the pleasure of communicating one of my types to the British Museum with some other specimens, and Mr. Butler, upon examination of the sending, informs me that in his judgment *Charocampa livida* is unnamed hitherto, although the British Museum possesses a worn specimen from Old Calabar.

Genus **DAPHNIS** Hüb.

20. **D. Nerii** Linn., Syst. Nat. 12, p. 798, No. 5 (1766).

I have three fine specimens of this widely distributed hawk moth, two of them bred at Kangwé, one taken at Benita. They are larger than European and Palestinian examples in my collection.

Subfamily SMERINTHINÆ.

Genus **POLYPTYCHUS** Hüb. (restricted by Butler.)

21. **P. Goodii** n. sp. **Plate IV, fig. 2.**

UPPERSIDE.—Head and thorax deep fawn, tinged with pink near tips of the patagiæ. Abdomen very light gray, almost white, shading at the sides and end into rosy fawn. Anterior wings much produced and falcate at apex, and deeply scalloped on the external margin at each neural interspace. The general tint of the primaries is a rich warm fawn; on the inner margin at the base is a tuft of hairs of a deep rose-madder tint, followed by a dark basal transverse line and two discal transverse lines, the outermost of which is very irregular and sinuate, suggesting with the discal dot, which is black pupiled with white, the outlines of a human face. This line is followed by two somewhat parallel lines of the same shade, which is succeeded by a narrow, black, submarginal line, extending from just below the apex to vein 3, where it is lost in a space densely irrorated with blue-black scales. The posterior wings are creamy white on the costa, light fawn on the inner margin, anal angle and fringe, and deep rose-madder over the rest of their surface.

UNDERSIDE.—Palpi, thorax, abdomen, femora of the first two pairs of legs and the last pair of legs throughout dark fawn, the tibiæ and tarsi of the two anterior pairs of legs are rosy and covered densely with blackish scales externally. Anterior wings of the same general color as above, but the marking more obscure, the costa and the internal margin white, and the disc rose-madder. Posteriors white, shading toward margin into light rosy fawn, the internal margin broadly rose-madder; two light brown lines originating on the costa beyond the middle traverse the wing and converge at the anal angle. Expanse of wings 110 mm.

Described from one female specimen in coll. Holland.

Hab.—Upper Ogové River (Good).

DEVITZIA* gen. nov.

Head small, slightly crested between antennæ. Eyes of medium size, prominent, without lashes. Palpi small, reaching only to the middle of the front, densely clothed, the vestiture of the first joint directed downward and of the second and third forward and upward leaving apparently a wide notch between the first and second joints. Antennæ biciliate; tongue very short, almost obsolete. Abdomen of medium length, narrow, terete. Costa of primaries straight, rounding at apex, apex acute, external margin nearly straight, internal margin slightly sinuate and produced at internal angle. Posteriors subpyriform, margin entire, rounded outwardly and slightly produced at extremity of the submedian vein. Vestiture of head and thorax somewhat coarse and shaggy, the general coloration ashen gray shading into pale brown.

NOTE.—In the Mitth. des Münchener Ent. Vereins for 1879, Dr. Dewitz described and figured an aberrant Smerinthine form under the name of *Smerinthus Pechuelii*. The type was a female; since then I have received specimens of a form closely allied to that described and figured by Dr. Dewitz. I cannot, however, bring myself to locate this insect with any sense of satisfaction in any of the Smerinthine genera known to me, and, at the risk of animadversion on the part of the "lumpers," I have resolved to set up a genus, to which I refer the forms *Pechuelii* Dewitz and *paupercula, mihi.*

22. **Devitzia paupercula** n. sp. **Plate IV, fig. 1.**

UPPERSIDE.—Coloration uniformly ashen gray, lightest on abdomen and internal margin of secondaries, inclining to pearly gray on costa and outward margin of primaries; a small reddish brown spot near the base of the primaries; discal dot at end of cell gray, pupiled with dirty white; very indistinct zigzag discal and median transverse lines; veins 3, 4, 5 and 6 each ornamented just before their extremity by two minute patches of raised black scales; near the apex on the costa is a triangular patch of pale brown, and on the inner margin just before the internal angle is a subquadrate spot of darker brown. Fringe of primaries checkered with dark gray on extremities of veins.

UNDERSIDE.—Uniformly lighter than upperside. Primaries and secondaries crossed beyond middle by two exceedingly faint, zigzag, transverse lines, and a series of minute black marginal dots on each vein. The fringe of the primaries is darker on the underside than on the upper, and is faintly but regularly checkered with white on the intraneural spaces. The fringe of the secondaries is of the same color as the adjacent parts of the wing and not checkered.

* In honor of Dr. H. Dewitz, the Curator of the Zoological Museum of the University of Berlin, whose contributions to a knowledge of the African insect fauna have recently been frequent and valuable.

Note.—The coloration of the genus faintly suggests *Cressonia*. The structure is very different, and reminds me of some Noctuidæ. Expanse of wings ♂, 70 mm.

Kangwé (Good).

Genus **BASIANA** Walker.

23. **Basiana Hornimanni** Druce. **Pl. III, fig. 5**; ♂, **fig. 6, pupa.** Entomologist's Monthly Magazine, vol. xvi. p. 268 (1880).

I submitted a rough sketch of the insect, a figure of which I give in the plate, to Mr. Druce, who identified it as *Hornimanni*. From the extremely brief description in the "Entomologist's Monthly Magazine" I should never have been able to have determined the species. My specimens, a male and a female *ex. larva*, are singularly fresh and perfect, and reveal many points to which Mr. Druce does not allude in his description. I question the reference of this species to *Basiana* of Walker. The truncated apex of the primaries and the slenderer form are differentiating marks worthy of attention. Expanse 4½ inches.

24. **B. enodia** n. sp. **Plate IV, fig. 3.**

Upperside.—Head, thorax and abdomen dark brown, with a few glaucous scales mingled with the vestiture of the top of the thorax. Primaries and secondaries of the same general color as the body; at the base of the primaries is a small patch of bluish green scales in the middle of which is a minute annulus of raised blackish scales. The wing is covered by a number of transverse waved lines, of which those on either side of the discal spot are double. The discal spot is large, rhombic, composed of light greenish gray scales bordered with dark brown; just before the apex and the internal angle are spots of an ill-defined shape of the same glaucous scales; the costa of the posterior wings is light brown, the remainder of the wing dark brown, adorned at the anal angle by a patch of blue-green scales. The end of the cell is marked by a line of dark raised hairs; the external margin, which is slightly excavated beyond the submedian nerve and crenulated, is faintly fringed with white in the indentations.

Underside.—Thorax and abdomen vermilion; tibiæ and tarsi of legs dark gray. Primaries light brown, shading into red on the limbal area; margin widely brown, a blue-gray spot at apex, and two ill-defined yellow streaks on limbal area between veins 2 and 4, bounded internally and externally by the geminated waved lines which starting on the outer third of the costa traverse the wing to the inner margin. Secondaries broadly vermilion from base outwardly as far as the waved submarginal line, beyond which they are darker and dusted with bluish gray scales. Expanse of wings 100 mm.

Described from one slightly damaged female in coll. Holland.

Kangwé (Good).

Subfamily ACHERONTIINÆ.

Genus **ACHERONTIA** Hüb.

25. **A. Atropos** Linn. *Sphinx Atropos* Linnaeus, Mus. Lud. Ulr. p. 348, No. 8 (1764). *Acherontia Atropos* Hüb., Verz. bek. Schmett. p. 139, No. 1494 (1816).

The specimens of this insect I have received from Gaboon are a little smaller than those I have received from Europe. There is, otherwise, no discernible difference between the West African specimens of the "Death's Head Hawkmoth" and those of Italy, France and Germany.

Subfamily SPHINGINÆ.

Genus **PROTOPARCE** Burm.

26. **A. fulvinotata** Butler, Trans. Z. S. Lond. vol. ix, p. 606 (1876). *Macrosila solani* (part) Walker, Lep. Het. viii, p. 206, No. 13 (1856).

I have one fine female of what I take to be this species, which is abundantly distinct from the *Solani* of Boisduval.

Kangwé (Good).

27. **P. Convolvuli** Linn. *Sphinx Convolvuli* Linn., Syst, Nat. i, ii, p. 789, No. 6 (1766).

I have several bred specimens of the species showing the female much lighter than the male.

Genus **NEPHELE** Hüb.

(Zonilia, Walker.)

28. **N. Accentifera** De Beauvois. *Sphinx Accentifera* De Beauv., Ins. rec. en Afrique, etc., p. 264, pl. xxiv, fig. 1 (1805), var. *Variegata* Butler, P. Z. S. 1875, p. 15, No. 31.

A number of fine males and females of this species are at hand from Benita and Kangwé. Mr. Butler assures me that his *variegata* is a variety of *accentifera*.

29. **N. Peneus?** Cramer. *Sphinx Peneus* Cram., Pap. Exot. i, p. 139, plate lxxxviii, fig. D (1779). *Nephele Peneus* Hopffer. Peter's Reise nach Mossambique, plate xxvii, fig. 11 (1862).

It is with some hesitation that I refer the specimens before me to *Peneus* of Cramer. His figure is wretched, whatever it may be intended to represent. The figure given by Hopffer is altogether too light in color for the forms received from West Africa, but otherwise they agree with it. The species of *Nephele* are apparently somewhat variable.

Kangwé (Good), Benita (Reutlinger).

30. **N. Comma?** Hopffer, Peter's Reise, plate xxvii, fig. 12 (1862). *Zonilia Comma* Boisduval, l. c. p. 142.

As in the case of the specimens referred to *Peneus*, so in the case of the specimens referred to *Comma*, I am in a measure of doubt. If my specimens are veritably *Comma*, then the remark of Mr. Butler, in the "Revision," must be repeated concerning them. He says: "Our example is darker and not so green as Hopffer's figure."

Benita (Reutlinger).

31. **N. Hespera?** Fabr., Syst. Ent. p. 546, No. 33 (1775). Saalmüller, Lepidopteren von Madagascar. Part I, p. 133, plate iv, fig. 42.

I have a male and female which are referable to *Hespera* of Fabricius by the exercise of some measure of laxness of construction as to descriptions and figures.

Benita (Reutlinger).

NOTE.—After having grubbed through the entire literature of the genus *Nephele* so far as known to me, I cannot but feel that there is need of a monographic revision of the genus, which will clear up the doubts and difficulties as to nomenclature, for which the wretchedly brief diagnoses of Fabricius and the more wretched figures of Cramer have given occasion.

Genus **ANTINEPHELE** gen. nov.

Body, as a whole, stout, fusiform and relatively short. Head small, laterally compressed with a low, but distinct crest between the antennæ. Palpi heavily scaled, stout and closely applied to the vertical front reaching to its top and apparently forming a part of the head. Eyes of medium size, without lashes. Antennæ of medium length, of almost uniform thickness from the insertion until just before the extremity of the slightly recurved tip, minutely ciliate in the male and simple in the female. Thorax stout, rounded in front; patagiæ small and closely applied. Vestiture of thorax smooth in front, tufted behind. Abdomen rather short, stout, conic, flattened on ventral aspect, with small and obscure tufts on the line of the spiracles. Fore legs without spines on tibiæ, middle tibiæ with one pair of unequal spurs; hind tibiæ with two pairs. Primaries *inserted just before the middle of the thorax;* costal margin straight, recurved at apex; apex rounded, external margin convex, entire; internal margin straight, or very slightly sinuous. Posterior wings subtriangular; costa straight, or feebly arcuate, external angle

rounded, external margin entire, rounded and slightly produced at the extremity of the second internal vein, thence straight to internal angle, inner margin straight, general coloration green to brown.

NOTE.—In the "Annals and Magazine of Natural History" December, 1882, p. 434, No. 6, Mr. A. G. Butler described a new hawk moth from Aburi, on the Gold Coast, to which he gave the specific name *Anomala*, and referred it to the genus *Nephele* Hüb. = *Zonilia* Walker. In doing so Mr. Butler remarks: "This singular little species has the general coloration rather of a *Diodosida* than of a *Nephele*, but in structure it appears to agree with the latter genus." I have lately received two species of hawk moths which are plainly congeneric with *Anomala* Butl., and constitute a natural group, to which I have given the name *Antinephele*. They are distinguished from *Nephele* by the relatively shorter length of the abdomen and its flattened ventral aspect, the more rounded apex of the primaries, the crest between the antennæ, the generally smaller size and the coloration which is very different in its general style from that of any of the other species referred to *Nephele* by authors.

I locate the genus provisionally in the subfamily of the Sphinginæ. My conviction is that it belongs more properly after *Lophura*, among the *Macroglossinæ;* or, to be still more exact, that it belongs to a group of genera, of which *Lophura* is one, which should be raised into a subfamily and placed between the *Macroglossinæ* and *Chærocampinæ*.

32. **A. Anomala** Butler. **Plate III, fig. 1.** Butler, Ann. and Mag Nat. Hist. Dec., 1882. No. 6.

Two males and one female.

Benita (Reutlinger).

33. **A. Maculifera** n. sp. **Plate III, fig. 2.**

UPPERSIDE.—Palpi brown. Head brown, marked with a median line of green and a narrow white line over the eyes. Thorax green, with the shoulders and patagiæ rich maroon, ornamented with a small tuft of white scales on anterior edge. Abdomen yellow ochraceous, anteriorly shaded with green as on the thorax. Upon the top of the first segment is a triangular patch of dark brown scales. *Anterior wings:* at the base a broad patch of brown of same color as the patagiæ, reaching not quite to the inner margin, bounded on its external margin by a narrow line of white. The discal area is brown, shaded with green and crossed by a number of transverse lines. A very small and exceedingly obscure grayish white discal dot is situated at the end of the cell: a broad brown shade arising about the middle of the costa sweeps diagonally across the wing as far as vein 4 and then turns abruptly upward and finishes at the apex. The triangular

space enclosed between the costa and this broad shade is light greenish obscurely marked with brown crescents. A series of dark brown sublunate spots narrowly margined outwardly by white extends from the lowest point of this greenish triangular space on vein 4 almost to the internal angle. *Secondaries* uniformly dull black.

UNDERSIDE.—Palpi, thorax, abdomen, innerside and outer half of tibiæ of hind pair of legs white. Two anterior pairs of legs brown; upon the middle of the second, third, fourth and fifth segments of the abdomen are triangular spots of bright rufous, those on the second and third segments large and conspicuous, those on the third and fourth minute. *Anterior wings* broadly brownish black, with the costa and a triple series of submarginal lunules extending from the costa two-thirds of the way to the inner angle rufous. Two small white dots are found at the apex. *Posteriors* grayish rufous, shading at the margin into blackish brown. Four or five obscure blackish bands appear upon the costa, but vanish before reaching the middle of the wings. Expanse of wings 48 mm.

Described from two specimens in coll. Holland, one of which has since been given to the British Museum.

Benita (Reutlinger).

34. **A. Muscosa** n. sp. **Plate II, fig. 8.**

UPPERSIDE.—Palpi, head, thorax and abdomen uniformly olive-green, save that in the male a very narrow white line ornaments the crest and top of the thorax. *Anterior wings* olive green over basal and discal area. This tint is terminated externally by a somewhat obscure brown shade running from beyond the middle of the costa diagonally to the internal angle, and is traversed by a number of obscure geminate olive-brown lines. The apical area beyond the diagonal brown shade is lighter green ornamented by a submarginal row of pinkish lunules and broadly shaded with dark brown on the margin below the apex. *Posterior wings* are uniformly dull black.

UNDERSIDE.—*Anterior wings* dull black, shading into reddish gray on costa and outer margin, traversed on limbal area by a triple row of reddish yellow lunules and having two minute white points at apex. *Posterior wings* yellowish brown, traversed by darker undulated lines arranged in pairs, and broadly brown on margin. Palpi, thorax, abdomen and legs, reddish cinereous. Expanse of wings 38–44 mm.

Described from three examples in coll. Holland, one of them since transferred to British Museum.

Benita (Reutlinger).

Description of new species of Japanese Heterocera.

BY REV. W. J. HOLLAND, D.D. PH.D.

It was my privilege, in the year 1887, to be invited by my friend, Prof. D. P. Todd, of Amherst College, to accompany the expedition sent by the United States Navy Department and the National Academy of Science, to Japan for the purpose of observing the total eclipse of the sun of that year. As the naturalist of the party I was accorded much courtesy and was enabled to prosecute somewhat widely investigations into the botany and zoology of the islands. The brief space of four months, during which I labored upon Japanese soil, was, however, all too short for satisfactory work, and I regret greatly that I was not able to devote a much longer time to study and research in this most interesting field. Nevertheless the results achieved were not altogether unsatisfactory, and I have the pleasure in the accompanying paper of presenting to the attention of the scientific world descriptions of a few species of Macrolepidoptera, which, so far as I am aware, have not yet been described. I confine myself in this paper mainly to species which, having resolved to name in honor of persons who were members of the U. S. Eclipse Expedition, or who rendered us assistance, I wish, therefore, to appropriate before some other entomologist shall have attached to them a designation.

HETEROCERA.

SPHINGES L.

Family SPHINGIDÆ Boisd.

Subfamily CHÆROCAMPINÆ Butler.

Genus **ACOSMERYX** Boisd.

1. **A. Iyenobu** n. sp.

UPPERSIDE.—Head, thorax and abdomen ferruginous, the head and thorax being redder than the abdomen. A light mouse gray dorsal line runs from the crest to the anal extremity of the abdomen, and a line of the same color passes just over the eyes along the lower edge of the tegulæ. The first and second segments of the abdomen are marked with black spots, the first of which is preceded by a tuft of mouse-gray hairs; the sides of the abdomen are lighter in color than the back. The antennæ are light yellow; the palpi are a shade paler than the head and grayish in color. *Primaries:* the general color of the primaries is gray with a lilac cast, inclining to ferruginous at the base and the costa.

A black spot is situated at the base near the hind margin; two brown curved bands run very obliquely from the costa before the middle toward the inner margin at the base, which they do not quite reach; beyond the middle is a broader and much darker band of the same color, which is parallel to the last named and terminates about the middle of the inner margin; beyond this a narrow sinuous line runs from the costa to the inner margin being shaded externally with pinkish ochreous and osculating on vein 5 with a dark submarginal line, which runs obliquely from the apex to vein 5 and then diverging at an obtuse angle, terminates at the internal angle of the wing. The triangular space enclosed between these two lines at the apex is dark brown; the triangular space included between the submarginal line and the outer margin is lilac-gray. *Secondaries:* base and discal area black, fading into gray on outer margin.

UNDERSIDE.—Palpi whitish, thorax and abdomen pinkish fawn color. Primaries and secondaries broadly pinkish fawn, the primaries shaded with black on disc and with a wide marginal shade of dark gray acutely angled at vein 5; secondaries crossed by ferruginous median and submarginal transverse lines, which are in some specimens faintly continued upon the primaries also. A broad marginal shade of the same color as on the primaries and also acutely angled on vein 5 completes the ornamentation of the secondaries. Exp. of wings 85–90 mm.

Type in coll. Holland.

I have given to this species, the first specimen of which I found sitting upon the side of the mortuary chapel of the Sixth Shogun in the Shiba Park at Tokyo, the name of that illustrious prince of the Tokugawa family.

BOMBYCES.

Family LIPARIDÆ Boisd.

Genus **EPICOPEIA** Westw.

2 **E. Hainesii** n. sp.—Allied to *Mencia* Moore (P. Z. S. Lond. 1874, p. 578, plate lxvii, fig. 8).

UPPERSIDE.—Head, thorax, abdomen and antennæ black, without any red markings whatever. *Primaries*, with the outer margin not as convex as in *Mencia*. gray, palest on the outer third, with the outer margin broadly black and the veins black. *Secondaries* deeply excised or concave on the outer margin, the line of curvature being continuous from just below the external angle to the extremity of the broad, somewhat short and very spatulate tail. The basal and discal areas are dark brownish gray, the outer third and the tail deep velvety black, and the veins all black. A crimson lunule appears just below the outer angle near the margin, and there are four crimson lunules extending from the anal angle in a marginal row to the origin of the tail.

UNDERSIDE.—Palpi and thorax black. Legs black, except femora, which are crimson. Abdomen black, with a crimson line running along the sides from the first segment to the last on the line of the spiracles, and the margin of each segment fringed with crimson. *Primaries* throughout light yellowish gray shading into blackish on the disc, the veins being pale brown gray. *Secondaries* exactly as on upper surface, save that the crimson lunules are somewhat larger and more sharply defined. Expanse of wings 62 mm.

Described from a male specimen in coll. Holland given me by Rev. Mr. Haines, of the Doshisha School in Kioto, who received it from Mrs. Gulick, who captured it upon Hi-yei-san, the lovely mountain rising to the Northeast of Kioto upon the boundaries of Yamashiro. I have seen several other specimens of this or a closely allied species taken on the volcano Asama-yama and contained in the collection of Mr. Harry Pryer, of Yokohama (No. 3 in Pryer's Catalogue; Trans. Asiat. Soc. Japan vol. xi, p. 239). As the species inhabits the mountains of the main island at an elevation of 3000 to 4000 feet, it will also very probably occur in Yesso.

Genus **ARTAXA** Walker.

3. **Artaxa Torasan** n. sp.—♂. Uniformly of a bright orange red. The upper surface of the posterior wings slightly clouded on the disc by fuscous. A small dash of obscure brown on the under surface of the primaries behind the costal margin of the apex. Expanse of wings 22 mm.

One ♂, Shirakawa, July. Type in coll. Holland.

I take pleasure in naming this beautiful little insect after my faithful Japanese assistant, Tora-san, of whose unfailing ingenuity and untiring perseverance I retain a most grateful recollection.

NOTODONTIDÆ.

BIRETA Walker.

4. **Bireta Southerlandii** n. sp. ♂. Prevalently pale straminеous, with a shade of pale brown running from the base of the primaries just below the cell and then curving upward to the apex. The upper surface of the secondaries is somewhat darker than that of the primaries. Antennæ heavily pectinated. The female does not differ in coloration from the male. Expanse of wings 40–44 mm.

Types in coll. Holland.

I name this species after Lieut. W. H. H. Southerland, of the United States Navy, who was detailed by Admiral Chandler to act as one of the assistants of the astronomer of the expedition.

Genus **NOTODONTA** Ochs.

5. **Notodonta Toddii** n. sp.

♀. UPPERSIDE.—Corselet ashen gray, bordered posteriorly by a line of black, which is continued upon the outer edges of the patagiæ. Thorax dark brown, with a geminate median line. Abdomen light gray. *Anterior wings* gray, inclining to brownish, traversed by a black, transverse, anterior line, greatly curved and denticulated, defined inwardly by pale gray and terminating upon the submedian nervule. The transverse posterior line is of a paler gray than the body of the wing. A reniform spot of the same pale shade is faintly visible.

A broad, blackish, subapical shade extends from a little below the apex on the outer margin to the transverse posterior line at the point where it crosses the third submedian nervule. A still broader and darker shade extends from the base of the wing below the cell terminating upon the outer margin at the second submedian nervule This shade is darkest on the intra-neural spaces; a small curved dash of black appears near the costa and parallel to it just before the apex. The nerves and nervules, especially near their marginal extremities are defined by black. *Posterior wings* uniformly dull gray with broad margins of a lighter shade, the nervules darker, especially toward their extremities.

UNDERSIDE.—Light ashen gray, with the basal and middle area of the anterior wings darker in color. Both wings have a dark shade crossing the end of the cell and both are crossed by a dark transverse posterior line vanishing before the inner margin is reached. Expanse of wings 62 mm.

Type in coll. Holland.

It is with some hesitation that I refer this fine species to the genus *Notodonta*. The only specimen I have seen is the type, which is a very fresh specimen taken at Yokohama, and another badly damaged example, likewise a female, in the collection of Mr. Pryer. The apparent absence of the tooth-like projection of the wing upon the inner margin of the primaries would indicate the propriety of referring to another genus, but, as this feature is less marked in the male than in the female sex of other species, I have not been willing to run the risk of creating a new genus for the reception of this insect, as I have been urged to do by one or two of my scientific friends who have examined the specimen.

I name the species in honor of Prof. David P. Todd, Director of the Amherst College Observatory.

NOCTUAE.

Genus **RUSINA** Boisd.

6. **Rusina Ripleyi** n. sp.- ♂ ♀. Front white, corselet and patagiæ dark gray, bordered with white. Thorax and abdomen lustrous pearly gray.

UPPERSIDE.—*Anterior wings* with an irregular black spot at base bordered externally with whitish, basal area dark gray, transverse anterior and posterior lines irregular, light grayish white, bordered on both sides by a narrow black line. There is a light spot in the cell bordered with black and followed by a dark transverse shade widest on the costa and interrupted by the reniform, which is black circled with light gray. The limbal area is darker gray than the middle area and is traversed by three somewhat parallel and very narrow black lines, the first two of which run obliquely from the direction of the costa toward the outer margin, and the third, which is broken, terminates upon the inner margin before the inner angle. *Posterior wings* light rufous gray, with the outer margins broadly blackish. Fringes whitish, checkered with the dark shade of the margin.

UNDERSIDE.—Body, legs and basal area of wings light yellowish gray, the tibiæ ringed with black. A dark bifid shade appears on the costa of both wings just before the black dot which is found at the end of the cell in both. The margins are broadly dark gray, widest at the costa. The female differs from the male only in the absence of the dense pectination of the antennæ. Expanse of wings 36 mm.

Types in coll. Holland.

I took this species abundantly at sugar at Shirakawa, Fukushima Ken. Mr. Pryer had never seen the species. I name it in honor of a friend who accompanied me upon the evening I took the largest number of specimens, and who has since lost his life in the Yellow Sea by the foundering of the steamer upon which he was going for an excursion to Borneo.

Genus **COSMIA** Ochs.

7. **Cosmia Pembertonii.**—Front, corselet, thorax and abdomen dark vinous brown.

UPPERSIDE.—*Anterior wings* vinous brown, darker upon the basal area; transverse anterior line white, bordered externally by dark brown and running obliquely in an almost straight line from a point on the costa one-third of the distance from the base to the middle of the inner margin; transverse posterior line white, bordered internally by dark brown, followed above the inner margin by a wide and even shade of vinous brown darker than the ground color of the wing. This shade is lost toward the costa in a large subtriangular spot of rich maroon which extends from the costa to near the middle of the wing and is ornamented by a comma-shaped dash of pure white, which is widest on the costa; a small, subtriangular spot of dark brown ornaments the limbal area just before the apex. *Posterior wings* dark testaceous. Fringes lighter, reddish.

UNDERSIDE.—Pinkish gray; the middle of the anterior wings clouded with blackish, darkest towards the outer margin; the white comma-shaped dash of the anterior wing reappears upon the underside, but is faint; the posterior wings have a blackish dot at the end of the cell and are crossed near the outer third by a transverse line, which is darkest on the costa and does not quite extend to the inner margin. Expanse of wings 30 mm.

Type in coll. Holland.

I name this species after P. A. Engineer, J. Pemberton, U. S. N., in recognition of his labors in connection with the Eclipse Expedition.

Hab.—Shirakawa.

Genus **CATOCALA** Schrk.

8. **Catocala Mabella** n. sp.

UPPERSIDE.—Head, front, thorax and abdomen, light ashen gray; the corselet is bordered above by a narrow line of dark brown. *Anterior wings* light pearly gray, palest on the middle area near the costa. Reniform whitish, with an annulus of pale gray, bordered with whitish. Subreniform of the ground color of the wing, subquadrate, narrowly margined with black. Basal line black, very narrow and in some specimens almost obsolete; transverse anterior line and

transverse posterior line very narrow, black, distinct, broadest on costa; limbal area traversed by a very faint gray submarginal line clouded on both sides by gray, slightly darker than the ground color of the wing. *Posterior wings* pale yellow, obscured by gray hairs at base and on inner margin. Median band broad, black, thickened and produced at end of cell, submarginal band broad, black, deeply sinuate internally opposite cell and just before the anal angle, the portion at the anal angle in some specimens appearing as a detached spot of black, bifid on inner side. At the external angle on the margin is a yellow spot shading into the fringes, which are broad, pale yellow, clouded with gray at the tips of the nervules.

UNDERSIDE.—Thorax, legs and abdomen whitish. *Anterior wings* of the same color as the body, clouded with gray on basal area, traversed by broad, black, median and submarginal bands, the former produced on vein 6, and the latter deeply sinuate opposite this projection. Margins gray, with a very narrow marginal line. *Posterior wings* of same color as underside of the abdomen shading into light yellow near the inner margin and anal angle. Markings as on the upper surface. Expanse of wings 60 mm.

Oiwake. Type in coll. Holland.

I name this species in honor of Mrs. Mabel Loomis Todd, the accomplished wife of Prof. Todd, whose presence did much to enliven the stay at the old castle of Shirakawa.

Genus **SYPNA** Guén.

9. **Sypna Watanabii** n. sp.

UPPERSIDE.—Prevailingly wood brown. *Anterior wings* lightest on middle area. Between the basal area, which is marked by a number of minute lines of darker color and the middle area, which is likewise thus ornamented, is a somewhat broad, sharply defined transverse anterior band of maroon margined with deep black and acutely toothed externally near the origin of the first submedian nervule. The transverse posterior line is very narrow, black, irregularly undate and toothed and margined externally by a broad shade of deep brown; a dash of black extends from the t. p. line along the first submedian nervule to the outer margin as a reappearance and prolongation of the tooth-like projection on the t. a. line. There is a subocellate spot of brown at the apex, preceded on the costa by a subquadrate spot of the same color. *Posterior wings* uniformly dark grayish brown, slightly lighter on the basal area.

UNDERSIDE.—Uniformly wood gray, darkest on limbal area; a dark shade at end of cell and a faint median line on both wings. Marginal line narrow and very regularly and beautifully crenulate. Expanse of wings 43 mm.

Hab.—Oiwake. Type in coll. Holland.

This species is represented in my collection by several specimens taken at sugar in August, at Oiwake, upon the flanks of the great volcano Asama-yama. I have seen also several specimens in Mr. Pryer's collection designated neither by number nor name. I take pleasure in naming this little creature in honor of Mr. H. Watanabé, President of the Imperial University at Tokio, to whom I am indebted for distinguished courtesies.

PITTSBURCH, PA., January, 1889.

Synopsis of North American species of the genus OXYBELUS.

BY CHARLES ROBERTSON.

In the preparation of this paper I am under obligations to Mr. E. T. Cresson, who has kindly sent me for study the specimens contained in the collection of the American Entomological Society.

Unless otherwise stated, all notes on the time of flight and the floral visits of these insects were made at Carlinville, Illinois.

The type specimens of all of the new species, except the new synonyms *Packardii* and *subulatus*, will be found in the collection of the American Entomological Society.

The species may be characterized in the following manner:

Squama terminating in a curved point.
  Spine entire at tip, face with pubescence more or less silvery.
    Abdomen of male without lateral spines (♂ of *similis* unknown); mandibles black or with a tinge of rufous; ornaments white, often more yellow in male.
      Spot on tegulæ, abdomen with basal spots separated.....1. **4-notatus.**
      No spot on tegulæ, abdomen with continuous fasciæ.....2. **similis.**
    Abdomen of male with lateral spines (♂ of *sericeus* unknown).
      Densely and very coarsely punctured, mandibles black.
        Prothorax punctured, spine sharp pointed ..... 3. **subulatus.**
        Vertex with median tubercle.....4. **cornutus.**
      Less densely and coarsely punctured, mandibles yellow.
        Ornaments whitish, more yellow in male.....5. **Packardii.**
        Ornaments more yellowish, very pubescent.....6. **sericeus.**
        Ornaments lemon-yellow, small, 4–5½ mm.....7. **lætus.**
        Ornaments orange-yellow.....8. **fulvipes.**
        Ornaments wanting, insect very black.....9. **niger.**
  Spine emarginate, face with golden pubescence.....10. **Cressonii.**
Squama with lateral curved point, spine emarginate.
  Spots on first segment connected by narrow fascia .....11. **mexicanus.**
  Spots on first segment widely separated.
    Front protuberant above, spine narrow; abdomen of male with four or five strong spines on each side, 10-spotted.....12. **frontalis.**
    Front convex in profile, spine broad; abdomen of male with two or three weak spines, 4–8 spotted .....13. **emarginatus.**
Squama without a curved point, spine very short.....14. **Forbesii.**

1. **Oxybelus 4-notatus** Say.

O. 4-notatus Say, Long's Second Expedition, 338.
O. impatiens Sm., B. M. Cat Hym., Pt. IV, 390.
O. interruptus Cress., Proc. Ent. Soc. Phil. iv, 475.
O. Brodiei Prov., Faun. Ent. Can. ii, 811.

♀.—Closely and finely punctured. Clypeal process prominent; prothorax carinate, scutellum with a median longitudinal carina; postscutellum short, more or less carinate. Squama small, short; spine short, truncate or rounded at tip; base of metathorax with few reticulations on each side of spine. Abdomen smooth and shining, closely and finely punctured. Black; pubescence yellowish on vertex and mesothorax, silvery on face. Spot on tubercles, sometimes wanting, spot on tegulæ and inner border of squama, white. Mandibles black, rufopiceous towards tip. Antennæ black, flagellum testaceous beneath; wing scales brownish. Abdomen: segments 1–4 with a narrow white line on each side, the lines more approximate on 3 and 4; 5th segment has a narrow fascia either continuous or interrupted, or is entirely black. Legs black; anterior tibiæ within, their tarsi, and tips of other tarsi, dull honey-yellow; middle and posterior tibiæ sometimes with a white spot at base exteriorly. Wings whitish or yellowish hyaline, nervures dull testaceous or honey-yellow.

♂.—Smaller, a little rougher and more coarsely punctured; spine narrower and more pointed; squama small; abdomen without lateral spines. Mandibles black; anterior tibiæ and tarsi in front white or honey-yellow; middle tibiæ from base towards tip exteriorly, and posterior tibiæ at base exteriorly, white; abdomen 4–10 spotted, the spots growing smaller towards apex.

Var. *a*.—Two spots on prothorax, anterior and middle femora at tips beneath, white. Legs inclining to dull ferruginous.

Var. **montanus**.—♀. Appears a little larger, more pubescent. Two spots on prothorax, sometimes wanting, tubercles, spots on squamæ sometimes connected by a line across postscutellum, white. Abdominal spots broader, more approximate, forming continuous bands on 4th and 5th segments. Legs inclining to dull ferruginous; anterior tibiæ and all tarsi more honey-yellow, the middle tibiæ sometimes honey yellow in front; middle and posterior tibiæ with more white at base exteriorly, on the former sometimes extending to tip. Wings more yellow, nervures honey yellow.

♂.—Abdomen 8–10 spotted; the ornaments more yellow and more extensive than in the typical form.

Var. *a*.—Abdomen 12-spotted, continuous fascia on 5th segment, hind tibiæ yellow to tip, tarsi honey-yellow. Length ♀, 5.5–8 mm.; ♂, 4–7 mm.

Canada, United States. Forty-seven females, sixty-two males (coll. Am. Ent. Soc. and C. R.).

A very common and variable species. Specimens from Montana show the richest livery, all the ornaments being present and widely extended. In *O. emarginatus*, also, Montana specimens show the same tendency.

I have taken it from May 9th to August 9th on flowers of Zizia, Heracleum, Pastinaca and Cicuta (Umbelliferæ).

2. **Oxybelus similis** Cress.

O. similis Cress., Proc. Ent. Soc. Phil. iv, 476.

♀.—Head and thorax rough, with rather coarse and close punctures. Clypeal process prominent; prothorax carinate; scutellum with a fine longitudinal carina; postscutellum not carinate, strongly produced and rounded behind; squama rising from the side of the base of postscutellum, small, short and strongly curved. Spine broad, parallel, truncate; base of metathorax finely striated on the sides; below spine, on the hinder plate, the median space is arrow shaped, terminating below in a smooth depression, which is long pointed towards insertion of abdomen. Abdomen with the segments densely and finely punctured at base, more coarsely and sparsely towards apical margin, which is smooth and shining.

Insect black. Pubescence rather long and yellowish on vertex and mesothorax, silvery on face. Mandibles, except tips, rufopiceous; flagellum piceous, testaceous beneath; wing scales honey-yellow. Abdomen: segments 1–4 with narrow lines on each side dilated towards the disc and almost meeting; 5th segment with two approximate dots on middle white. Legs black, anterior tibiæ and tarsi, and all tarsi at tips dull honey-yellow. Wings hyaline. Length 6.5 mm.

Colorado. One female, the type specimen (coll. Am. Ent. Soc.).

Resembles 4-*notatus*, but is more coarsely punctured, the metathorax is less rugous and the postscutellum has a different form. Differs also in the ornamentation of abdomen and in the color of tegulæ.

3. **Oxybelus subulatus** n. sp.

O. mucronatus Pack. (*nec* Fabr.), Proc. Ent. Soc. Phil. vi, 436.

♀.—Head and thorax densely and very coarsely punctured. Clypeal process prominent; prothorax punctured, hardly carinate or angular on the sides; scutellum and postscutellum with a median longitudinal carina; squama rather small and short pointed; spine tapering to a sharp point, channeled above at base. Base of metathorax rough, with large polygonal reticulations. Median space below spine with coarse reticulations above, terminating below in a smooth depression; lateral faces with coarse reticulations, punctured. Abdomen convex, smooth and shining, very coarsely and rather sparsely punctured, with a deep and narrow longitudinal channel at base, segments depressed on apical margin, strongly constricted between the segments. Black; pubescence thin and white, dense and silvery on face. Tubercles, spot on tegulæ, spot on inner margin of squama, whitish. Mandibles black, with a tinge of rufous in middle. Antennæ black, paler towards tip. Wing scales pale testaceous; squama whitish. Abdomen: segments 1–4 with an elongated whitish spot on each side. Legs black, anterior and middle femora at tips beneath, all tibiæ at base exteriorly extending more or less towards tip, whitish. Tarsi brownish: wings hyaline, fuscous towards tip in front, nervures testaceous.

Var. ♀.—Differs in the following: two spots on prothorax, and postscutellum yellowish. Abdomen: 1st segment with a large spot on each side, 2d with two long spots pointed and almost meeting on disc, 3, 4 and 5 with a broad continuous band, yellowish. Anterior and middle tibiæ exteriorly and anterior tarsi yellow ferruginous (Colorado).

♂.—Resembles the female, but is a little more coarsely punctured, base of metathorax with radiating striæ on the sides, extreme sides of abdomen with rather long spines. Two spots on prothorax, anterior and middle femora more yellow at tips, anterior and middle tibiæ more yellow exteriorly; abdomen 8–10 spotted. Length ♀, 8-9 mm.; ♂, 6–8 mm.

Pennsylvania, Illinois, Montana, Colorado. Three males, two females (coll. Am. Ent. Soc.).

4. **Oxybelus cornutus** n. sp.

♂.—Head and thorax densely and very coarsely punctured. Clypeal process prominent; posterior ocelli each placed on the upper and outer side of a tubercle which is prominent, smooth and shining; these ocelli, therefore, do not face in the usual direction, but look upwards and outwards. On the vertex behind the posterior ocelli and midway between them is a third tubercle, which is smooth and shining. Prothorax carinate, angulated on the sides, impunctate; scutellum and postscutellum with a median longitudinal carina, which is more prominent on the latter. Spine long, not deeply channeled, slightly widening towards the rounded tip. Base of metathorax with radiating striæ; below the spine there is a small triangular fossa, which is smooth and shining; lateral faces punctured, with parallel striæ running from a strong median carina. Abdomen with stout lateral spines, deeply constricted between the segments, very coarsely punctured; truncation concave; basal segment narrowly and deeply depressed medially, giving the abdomen a cordate appearance. Black; face with white pubescence. Two spots on prothorax, tubercles, inner border of squama whitish. Middle of mandibles rufous; flagellum reddish towards tip beneath. Tegulæ and base of wing honey-yellow; squama whitish hyaline. Abdomen with ten spots on the sides whitish. Legs black, anterior and middle femora at tips beneath, line on tibiæ exteriorly whitish, tarsi piceous. Wings hyaline, nervures dull ferruginous. Length 7.5–9 mm.

Montana. Two male specimens (coll. Am. Ent. Soc.).

One specimen has the mesothorax rufous in front, more extensive on the sides over the tegulæ.

5. **Oxybelus Packardii** n. sp.

O. lætus Pack. (*nec* Say), Proc. Ent. Soc. Phil. vi, 434.

♀.—Smooth and shining. Head and thorax rather closely and coarsely punctured. Clypeal process prominent; prothorax carinate; scutellum and postscutellum with a median longitudinal carina, more prominent on latter. Spine channeled above, rounded or truncate at tip; base of metathorax with few large reticulations. Median space on posterior plate terminating below in an oval depression, which is smooth and shining; lateral faces finely roughened. Abdomen smooth and shining, rather closely and finely punctured, slightly depressed at base medially, segments somewhat depressed on apical margins. Black, clothed with white pubescence, which is dense and silvery on face, more yellowish on mesothorax. Interrupted band on prothorax, tubercles, two spots on scutellum, inner borders of squamæ and posterior border of postscutellum sometimes more or less, whitish. Mandibles, except tips, honey-yellow; flagellum and scape at base and apex fulvous. Wing scales testaceous, squama whitish hyaline. Ab-

dominal segments 1–4 with whitish spots on each side, widely separated on first and second, narrower and closer on third and fourth; fifth segment black, or with two small spots on middle; apical segment rufous, sometimes nearly black. Legs black, anterior tibiæ and tarsi yellowish or ferruginous, and apical joints of other tarsi ferruginous, middle and hind tibiæ sometimes whitish at base exteriorly. Wings hyaline, nervures dull ferruginous.

♂.—More closely and coarsely punctured, abdomen with rather long lateral spines, the ornaments more yellow. Prothorax usually, scutellum and postscutellum black. Abdomen 8-spotted, the spots diminishing towards apex. Anterior femora at tips sometimes, all tibiæ at base extending more or less towards tips, yellow, tarsi pale or brownish.

Var. **texanus** ♀.—Prothorax and tubercles sometimes black; scutellum black. Antennæ darker above; wing scales and extreme base of wing generally honey-yellow. Abdomen 4–8 spotted, or nearly black, the ornaments sometimes reduced to two small faint spots on first segment. Legs inclining to ferruginous; tibiæ at base exteriorly, sometimes to the tips of posterior pair yellowish. Wings hyaline, nervures yellow.

♂.—The tubercles, anterior femora at tips beneath, all tibiæ exteriorly, tarsi, 4-6 spots on abdomen, yellow. Length ♀, 6.5–8 mm.; ♂, 5.5–7 mm.

Illinois, Texas. Eleven males, twenty females (coll. Am. Ent. Soc. and C. R.).

I have taken it from June 8th, to August 9th on flowers of Eulophus, Cicuta and Sium.

Dedicated to Dr. A. S. Packard, Jr., who first described it.

6. **Oxybelus sericeus** n. sp.

♀.—Head and thorax finely and closely punctured. Clypeal process low; prothorax carinate; scutellum with an obscure longitudinal carina; postscutellum carinate. Squama ovate, rather short pointed; spine long and narrow tapering to a truncate tip; base of metathorax reticulated; median space below spine narrowing to a point near insertion of abdomen; lateral faces finely roughened. Abdomen very finely and rather sparsely punctured, smooth and shining, longitudinally impressed at base, apical margins of segments hardly depressed. Black, thickly clothed with long white pubescence, which is dense and silvery on face and on apical margins of abdominal segments. Two spots on prothorax, tubercles, spot on tegulæ, two remote spots on scutellum and spots on squamæ, yellowish. Mandibles, except tips, honey-yellow; flagellum dull honey-yellow, black at base; tegulæ testaceous; spine whitish on apical half. Abdominal segments 1–4 with an elongated yellowish spot on each side, the spots somewhat emarginate in front; apical border of fifth and all of sixth segment pale rufous. Legs black, middle femora at tips beneath, tibiæ exteriorly and and anterior tarsi yellowish, the other tarsi ferruginous at tips. Wings hyaline, nervures testaceous. Length 7 mm.

Illinois. One female specimen (coll. Am. Ent. Soc.).

Resembles *O. Packardii*, but is smaller, more finely punctured and with a different livery.

7. **Oxybelus lætus** Say.

O. lætus Say, Bost. Journ. Nat. Hist. i. 375.

♂.—Head and thorax coarsely and closely punctured. Clypeal process prominent; prothorax carinate; scutellum with a median longitudinal carina; postscutellum with a prominent carina, resembling a short spine from the side; squama long and narrow. Spine long and narrow, deeply channeled above, rounded at tip; base of metathorax with coarse reticulations. Abdomen slightly impressed at base, rather coarsely and not very closely punctured, apical margins of segments depressed, lateral spines minute. Black, smooth and shining; pubescence on face silvery, on vertex and mesothorax brownish. Mandibles, except tips, interrupted line on prothorax involving tubercles, two large spots on scutellum and inner border of squama, lemon-yellow; flagellum fulvous, darker at base, tip of scape yellow. Wing scales testaceous. Spot on each side of segments 1–5, and sometimes apical margin of 6th segment of abdomen, yellow. Legs black, femora at tips, more broadly on anterior, tibiæ exteriorly and tarsi, yellow. Wings hyaline, nervures dull ferruginous. Length 4–5.5 mm.

Virginia, Illinois. Two male specimens (coll. Am. Ent. Soc. and C. R.).

I took one of these on flowers of Cicuta maculata, July 12, 1887.

Resembles *O. Packardii* ♂, but is much smaller, the legs more yellow, the scutellum spotted.

8. **Oxybelus fulvipes** n. sp.

♂.—Head and thorax closely and coarsely punctured. Clypeal process prominent; prothorax carinate; scutellum and postscutellum with a strong longitudinal carina; squama ovate, long pointed. Spine deeply channeled, narrowing above to truncate tip; base of metathorax with coarse reticulations. Median space below spine reticulated and shining. Abdomen triangular, smooth and shining, with a broad shallow depression at base; segments with apical margins depressed, more sparcely punctured in middle, with short lateral spines. Black, pubescence on vertex and mesothorax yellowish, elsewhere whitish, dense and silvery on face. Antennæ, interrupted line on prothorax involving tubercles, tegulæ, extreme base of wing, bilobed transverse line on scutellum, inner border of squama, spine, legs entirely, spots on each side of first and second segments of abdomen, larger on first, reddish orange. The mandibles, except tips, tips of anterior femora, anterior and middle tibiæ exteriorly and tarsi, lighter yellow. Coxæ mostly blackish, apical segment of abdomen red. Wings a little dusky, nervures dull testaceous. Length 7 mm.

One male specimen, taken at Orlando, Florida, March 15, 1887, on flowers of Hydrocotyle umbellata.

9. **Oxybelus niger** n. sp.

♂.—Smooth and shining, not very closely or coarsely punctured. Clypeal process feeble; prothorax carinate; scutellum feebly, postscutellum strongly longitudinally carinate; postscutellum strongly produced behind over base of spine; squama ovate, rather short pointed. Spine rather short, parallel, narrowed near apex to the truncate tip; base of metathorax with few radiating rugæ on the sides. Median space below spine broad arrow shaped, smooth and

shining below; lateral faces with few transverse rugæ above, closely punctured. Abdomen smooth and shining, finely and unevenly punctured, slightly impressed at base, extreme sides with short spines. Black, pubescence on vertex and mesothorax black, with a brownish reflection; on face, cheeks, pleuræ and sides of abdomen, white. Mandibles, except tips, flagellum, anterior tibiæ and tarsi, honey yellow. Apical joints of middle and hind tarsi piceous. Wings hyaline, nervures black. Insect very black, even the tegulæ and squama. Length 5.5 mm.

Illinois. One male specimen, taken on Sium cicutæfolium on Aug. 8, 1888.

10. **Oxybelus Cressonii** n. sp.

♀.—Smooth and shining. Head and thorax coarsely and rather closely punctured; prothorax carinate; scutellum slightly, postscutellum more strongly carinate. Spine broad, emarginate at tip; base of metathorax with few fine lines; posterior plate smooth. Abdomen smooth and shining, sparcely punctured, punctures closer near base of segments, apical segment rough with sparce punctures. Black, pubescence on vertex and mesothorax yellow, on face dense and golden. Antennæ entirely, mandibles, except tips, tubercles, spot on tegulæ, femora at tips, most broadly on anterior pairs, tibiæ, except a dark spot in middle, and tarsi, light lemon-yellow. The tarsi paler. Tegulæ testaceous. Wings hyaline, nervures dark. Length 4 mm.

Illinois. One female specimen, taken July 12, 1887, on flowers of Cicuta maculata.

Dedicated to Mr. E. T. Cresson.

11. **Oxybelus mexicanus** n. sp.

♀.—Densely punctured. Face broad, rather protuberant above; prothorax carinate; scutellum and postscutellum with a median longitudinal carina; squama very short and broad. Spine deeply channeled above, slightly wider at tip and deeply emarginate; base of metathorax with few radiating striæ. Abdomen closely and finely punctured, slightly impressed longitudinally at base. Black, legs brownish, pubescence on vertex and mesothorax yellowish, on face silvery. Prothorax involving tubercles, spot on squama, middle femora from tips beneath, fasciæ on abdominal segments 1–5 widening on sides of 1st and sometimes slightly interrupted medially, yellow. Mandibles, except tips, flagellum at tip beneath, anterior tibiæ and tarsi, and tegulæ, dull honey-yellow. Apical segment of abdomen rufous. Wings hyaline, nervures brown. Length 7 mm.

Mexico. One female specimen (coll. Am. Ent. Soc.).

12 **Oxybelus frontalis** n. sp.

♀.—Densely punctured. Front of head broad and quadrate, border of eyes straight. Face abruptly receding from a transverse ridge marked by the summit of scape to the clypeus. Middle of face flat; front strongly projecting, the salient portion narrowing below to middle of face; prothorax carinate; scutellum and postscutellum longitudinally carinate; squama rounded. Spine narrow, widening above, strongly furcate; base of metathorax with fine radiating lines. Abdomen smooth and shining, finely and closely punctured, base impressed.

Black, pubescence short and glittering, more dense and whitish on face. Mandibles, except tips, interrupted line on prothorax, tubercles, spot on tegulæ, spot on squama, 8–10 elongated spots on abdomen, yellow; flagellum black, paler at tip; tegulæ testaceous. Legs black, anterior tibiæ and tarsi dull honey-yellow. Apical segment of abdomen rufous. Wings hyaline, nervures dark.

♂.—Resembles the female, a little more coarsely punctured, the sculpture of face sometimes poorly defined, abdomen with four or five strong lateral spines scape in front more or less, anterior and middle femora at tips beneath extending more or less towards base, tibiæ exteriorly, and tarsi yellow, the latter sometimes brown. The abdomen has five pairs of narrow spots, those on fifth segment sometimes forming a continuous line. Apex of sixth segment and all of seventh rufous, the sixth sometimes with yellow band. Length ♀, 5-6 mm.; ♂, 4-6 mm.

Pennsylvania, Illinois, Texas. Twenty-seven females, forty males (coll. Am. Ent. Soc. and C. R.).

Resembles *O. emarginatus*, but easily distinguished by sculpture of front, the narrower spine, the darker legs of female and 10-spotted abdomen of male.

The commonest species in my neighborhood; I have taken it from June 7th to August 18th on flowers of Eulophus, Pastinaca, Cicuta, Sium, Eryngium (Umbelliferæ), Pycnanthemum (Labiatæ) and Asclepias verticillata (Asclepiadaceæ).

13. **Oxybelus emarginatus** Say.

O. emarginatus Say, Bost. Journ. Nat. Hist. i, 375.

O. parvus Cress, Proc. Ent. Soc. Phil. iv, 476, ♂.

♀.—Densely punctured; prothorax carinate; scutellum and postscutellum with a central longitudinal carina; squama large, ovate. Spine broad, square, hollowed above, broadly furcate at tip; base of metathorax with few radiating striæ. Abdomen closely punctured; basal segment with a median depression. Black, pubescence silvery on face. Mandibles, except tips, sides of prothorax, tubercles, two small remote spots on scutellum sometimes wanting, pale yellow; flagellum testaceous beneath. Wing scales and extreme base of wing reddish testaceous. Abdomen with four to eight elongated yellow spots on the sides: the fifth segment is black, or partly or wholly rufous; in one specimen from Montana the fifth segment is black, with two yellow spots, making the abdomen 10-spotted; apical segment rufous. Legs black: the anterior femora at tips beneath extending more or less towards base yellow, the middle like the anterior, or sometimes entirely black; anterior tibiæ and tarsi, two hinder pairs of tibiæ at base exteriorly extending more or less towards tips, yellow. Wings hyaline, nervures dull ferruginous.

Var. ♀.—Scutellum hardly carinate; prothorax, scutellum and tubercles black; middle tibiæ yellow in front; tegulæ darker than in the common forms (Nevada).

♂.—Resembles the female; a little more strongly punctured. Abdomen with two or three lateral spines; scutellum black; prothorax and tubercles black, or with a little yellow; all tibiæ yellow to tips exteriorly; tarsi generally all yellow.

sometimes the middle and hind pairs darker; abdomen generally 4, sometimes 6 or 8 spotted; a single specimen from Illinois has the abdomen entirely black. Length ♀, 4-6 mm.; ♂, 3.5-5.5 mm.

United States. Forty-nine males and thirty-five females (coll. Am. Ent. Soc. and C. R.).

Specimens from Montana show the richest livery. All of the ornaments are present and most widely expanded.

I have taken this species from June 6th to August 15th on flowers of Eulophus, Pastinaca, Cicuta and Sium.

14. **Oxybelus Forbesii** n. sp.

♂.—Very finely and densely punctured and roughened. Face long, flat; clypeus produced; vertex with an angular protuberance on each side behind summit of eyes; prothorax not carinate nor angular on sides, finely punctured; scutellum semicircular, more coarsely and sparsely punctured, not carinate; postscutellum triangular, finely roughened, not carinate; squama forming a linear membranous border on the postscutellum, little wider behind and terminating obtusely on side of spine. Spine very short, its tip only rising a little above level of postscutellum; base of metathorax finely roughened with few radiating lines; hinder plate finely roughened, below spine with an ovate depression, which is smooth and shining. Abdomen without lateral spines, elongated, sides nearly parallel, apex rather broad; surface smooth and shining, finely roughened with shallow punctures.

Insect black. Mandibles, except tips, scape at tip and in front, flagellum beneath, line on prothorax involving tubercles, postscutellum, femora at tips, tibiæ and tarsi, and apical margins of abdominal segments, pale yellow. Tarsi more honey-yellow; tegulæ testaceous. Wings hyaline, nervures testaceous. Length 4 mm.

Colorado. One male specimen (coll. Am Ent. Soc.).

Dedicated to Prof. S. A. Forbes, of Champaign, Ill.

Undetermined.

Oxybelus uniglumis Linn.

Two new species of Butterflies.

BY HENRY SKINNER, M. D.

Anartia Dominica nov. sp.

The male expands two inches and the female two and three-eighths inches. The male is of a seal-brown color and near the inner angle of the superiors has an ocellus consisting of a black spot surrounded by a brownish orange the same color as in *A. lytrea* Godt. Just below this on the inferior margin is a small dash of the same color. There is a row of five marginal spots also of brownish orange; running across the wing from the centre of the costa is a white band about one-eighth of an inch wide which reaches almost to the ocellus at the inner angle. This white band is irrorate or slightly dusted with brown, and the margins are not as clearly defined as in *A. lytrea*. The veins, which are brown, run through it. There is a transverse black line crossing the wing from the costa to the first vein above the anterior margin. Inside of this toward the base are two black annulations the width of the discoidal cell; where the costa joins the thorax is a small semicircular black line.

The antennæ, palpi, eyes, thorax and abdomen are all of the same color which is identical with the ground color of the wings. The inferior wings are the same color as the superior, or perhaps a shade lighter. Extending across the centre of the wing and filling five nerve spaces is a white band similar to the one on the superiors. There is a submarginal black line and a marginal row of six brownish orange crescents and a small black anal spot surrounded with the same brownish orange. The inferior wings are emarginate and not tailed. The female is two or three shades lighter in color than the male, and has three or four faint brownish orange spots between the white band and the transverse line on the inferiors. The underside does not differ much from the upper.

The species has the same general appearance as *lytrea*, but differs from it materially. As compared with *lytrea* it is larger, especially the female, lighter in color, and the white band is irrorate, while in *lytrea* it is more clearly defined and of a dead white color. The inferior wings lack the small pointed tail found in *lytrea*. The ocellus on the superiors is larger, and on the inferiors smaller than in *lytrea*; the one on the superiors has no red dash under it in *lytrea*. The

marginal spots in *lytrea* are smaller, fainter and internally edged with black, while in *Dominica* they are plain. The transverse line on the superiors of *Dominica* starts from the costa, and in *lytrea* from the white band. The principal differences on the inferiors are the longer and very much narrower white band in *Dominica*, and the heavy black inner lining of the crescents and the darker black of *lytrea*. The hind wings of *lytrea* have distinct pointed tails. The two species also vary considerably beneath, but the differences given are all sufficient to separate them.

Described from five specimens, four males and one female. Two were caught at Samana Bay, by Dr. W. L. Abbott, and are in the collection of the Am. Ent. Soc. Two were presented to me by my friend, Mr. E. M. Aaron, and one received from Mr. A. G. Weeks, Jr.; all are from Hayti.

Myscelia Streckeri nov. sp.

The male expands two and one-eighth inches and the female two and a half inches. The superior wings are of a rich black with a purplish cast, a broken line of bluish purple marginal dots run very close to the exterior margin. There are three white apical spots surrounded by the same heliotrope color; running from the base for about one-quarter inch into the discoidal cell are two of heliotrope or purple-blue; starting from the base is a large blotch of the same color extending into the wing for nearly one-half inch. The inferior wings are emarginate and of the same color as the superiors only somewhat lighter, and have the same marginal spots with a faint indication of a submarginal band. There is a heliotrope blotch on the inferiors similar to that on the superiors; the underside of the inferiors and the apices of the superiors on the underside look very much like the underside of the inferiors of *Pyrameis atalanta*, and I think cannot be described in words.

The ♀ is larger, lighter in color, and in addition to the three apical spots has two on the wing near the centre of the costa, and three which are submarginal. The three apical spots are not surrounded by heliotrope color as in the male, and the others are plain white. The underside is the same as in the male.

Described from five specimens from Lower California through the kindness of Mr. A. G. Weeks, Jr.

I take pleasure in dedicating this species to my friend, Dr. Herman Strecker.

Catalogue of the Coleoptera common to North America, Northern Asia and Europe, with the distribution and bibliography.

BY JOHN HAMILTON, M. D.,
Allegheny, Pa.

The primary object in composing this catalogue was to facilitate the exchange of Coleoptera between the collectors of both continents who desired to obtain as many as possible of the species common to both. It was then seen that the addition of the distribution of these species in this country so far as known, and also a general view of the European and Asiatic distribution, would be of great use, and valuable in other directions. Catalogues with the general distribution of the species in Europe and Asia are available by the American student or collector, but no work of this kind has been attempted in America, and the distribution with us of the species common to both countries is mostly unknown in Europe, and known even here to comparatively few.

The information relating to the American distribution has been gleaned from the works of our systematic authors, and the various catalogues of collectors as will be seen by the bibliographical references; while my own collection, and specimens obtained from many places, have enabled me to give much local distribution not heretofore on record. The cabinets of many collectors would, no doubt, add much knowledge in this direction were their contents known. The want of local catalogues at several points was greatly felt in prosecuting this work, notably Nova Scotia, Massachusetts, District of Columbia, Louisiana, Manitoba, British Columbia. The Kansas catalogue is too disjointed to be easily consulted.

Where Alaska, Sitkha, Kenai, Unalaschka, Kadjak are mentioned without reference, in nearly every instance Mannerheim's contributions to a knowledge of the Coleoptera of the Pacific coast are the authority. The first of these was published in the Bulletin of the Imperial Society of Naturalists of Moscow in 1843, and supplements in 1846, 1852 and 1853 respectively, the whole constituting a catalogue in which all the species taken in Alaska till the date

last mentioned are enumerated and described, with bibliography and localities; the description of the brachelytra and some other minute things having been furnished by Maeklin. This includes all the Alaskan species made known in 1829 by Eschscholtz in his Zoological Atlas, and by Menetries, Motschulsky and others in various publications till 1853, since which time comparatively little has been added from any and all sources to our knowledge of the Coleoptera of that region. After excluding all species described from the Pacific coast not found in Alaska, there remained 540 species belonging to that fauna, the greater number of which occurred in Sitkha and the peninsula of Kenai. As the species from Alaska, Siberia and Arctic Europe mentioned in the following work, nearly all passed through the same hands their identity is reasonably certain.

The European distribution is indicated only in general. The Asiatic is derived from various sources, and whoever desires to pursue that distribution further will find the complete bibliography in the Catalogue of the Coleoptera of Siberia and the Russ–Asiatic provinces by Lucas von Heyden, Berlin, 1880–81, and 1885–87.

A number of the species have undoubtedly been introduced from Europe into this country in articles of commerce, or by some accident, and have become naturalized; others again are just as certainly indigenous in both hemispheres, while a certain number are of doubtful origin, about which it has been thought best to express no opinion, leaving this to individual speculation.

At some remote period in the past America and Asia were certainly connected on the North by land, and had then a much milder climate than now exists, and, without doubt, when scientific enthusiasm shall have overcome the formidable obstacles that have hitherto prevented all but the most superficial collecting in these inhospitable regions of both continents, many species will be found to inhabit them in common. The species that are known to be indigenous to both appear to have practically undergone no variation, though no small division of time must have intervened since the separation of their ancestors. *Loricera cærulescens*, from Lake Superior and from Scotland, do not seem to vary to the extent of a hair on the antennæ. *Eretes sticticus*, from Asia Minor and from Texas, appear absolutely identical in every point. *Corymbites tessellatus*, from Canada and from the Italian Alps, can only be separated by the labels, and I might enumerate many other species that I have seen and compared. Several European species, not included in this cata-

logue, have been mentioned in parts of our literature as occurring in America, but the determinations have been erroneous, or the species when introduced have failed in self propagation.

The great number of species common to Siberia, the Lake Superior region and the Rocky Mountains of southern Colorado, around Veta Pass is noticeable, the interpretation of which is that the Coleoptera of these regions have been more extensively collected and identified than elsewhere. When other elevated or northern parts of the continent having a similar temperature and corresponding conditions shall have been as carefully gone over the same results may be confidently predicted.

Bibliographical Abbreviations.

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Austin—Catalogue of the Coleoptera of Mt. Washington, N. H., Proc. Bost. Nat. Hist. Soc. vol. xvi.

Blanchard—Mr. F. Blanchard by letter or specimens.

B. J.—Boston Journal of Natural History.

Bowditch—LeConte's List of Coleoptera collected by Mr. F. C. Bowditch in the Rocky Mountains, Bull. U. S. Geol. and Geog. Surv. Terr., vol iv. No. 2, 464.

Bull. B.—Bulletin of the Brooklyn Entomological Society.

Can. Ent.—Canadian Entomologist.

Casey—Revision of the Stenini of America North of Mexico.

C.—Classification of Col. of N. A. LeConte and Horn, 1883.

Crotch—Revision of the Coccinellidæ by G. R. Crotch, A. M., London, 1874.

Dury—List of Coleoptera around Cincinnati, Ohio. 1879, 1882, 1884.

Col. Am.—Coleoptera of Eastern Siberia, and especially of the river Amour, by Motschulsky, St. Petersburgh, 1860 [Tr.]

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" in lit.—Manuscript List. Supplemental.

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CARABIDÆ.

1. **Cychrus angusticollis** *Fisch., velutinus* Menet.

This species occurs from Unalaschka and Sitka, whence I have specimens, to northern California. It also inhabits Kamtschatka, Heyden, 5.

2. **Carabus Vietinghovi**, *Adams.*, var. *fulgidus* Fisch., var. *Schaumi* Mor.

This beautiful species inhabits Alaska, extending east towards Hudson Bay, and south towards British Columbia (Horn). Can. Ent. viii. 127; Pr. 1873, 322, Asia (Turkestan, the Amur country and on the Lena), Heyden, 6; Mots., 102; Heyden, 1886.

3. C. Mæander *Fisch.*, *Lapilayi* Lap. *Tatumi* Motsch. *palustris* Fisch.

This species occurs in Michigan, the Lake Superior region, Canada, the Hudson Bay region, Manitoba. "Extends from North America through Kamtschatka to Siberia (Horn)." Pr. 1873, 322; LeConte Cat.; Heyden, 8; Motsch., 95; Col. Am., 99.

4. C. truncaticollis *Esch.*

Occurs in Alaska, and has been taken in the higher parts of the Sierra Nevada, California. In Asia it occurs in Kamtschatka. T. ix. 31; Heyden, 6.

5. Elaphrus riparius *Lin.*, *sinuatus*, *similis* Lec., *intermedius* Kirb., *californicus* Mann.

A species somewhat variable and widely distributed, extending from New Mexico through the Rocky Mountains to California and Alaska, and eastward to Michigan and Canada. It is general in Europe, and in Asia from the Crimea, Turkestan, Dauria and Amur country northward through Siberia. Mots., 72; Col. Am., 88; Solsky, 233; Heyden, 4; Chaud., 217.

6. Diachila arctica *Gyll.*

"Common to both Europe and America." Cl., 11, Europe (Lapland), Asia (Arctic Siberia); Heyden, 5.

7. Blethsia multipunctata *Lin.*

I have specimens from northern Wisconsin. Schwarz and Hubbard took it at Escanaba, Mich. "Northern United States," Bull. B. i, 29. Central and northern Europe. Arctic and western Siberia, Mots., 93; Heyden, 5.

8. Loricera cærulescens *Lin.*, *semipunctata* Mann., *neoscotica* Lec., *pilicornis* Fab.

This species occurs in northern Michigan, the Lake Superior region, Nova Scotia, "north of Europe and of the United States." Bull. B. i, 29; L. S., 208; An. Lyc., iv, 162; central and northern Europe; W. and E. Siberia, var. *rufilabris* Mots.; Kamtschatka, the Amur. Mots., 141; Col. Am., 96; Heyden, 21.

9. Notiophilus sibiricus *Mots.*, *confusus*, *punctatus* Lec.

This beetle is distributed from Tennessee northward to Hudson Bay, and from New Mexico through the Rocky Mountains to the Pacific. It is found in Arctic Siberia, the Transbaical and Mongolia, but does not reach Europe. Mots., 85; Heyden, 4.

10. N. aquaticus *Linn.*

No record of this species occurring in our fauna has been observed,

except in error, and Dr. Horn does not know of its identification. western and the southeast parts of eastern Siberia. Mots., 85; Heyden, 4.

11. **Leistus piceus** *Froh.*

"A specimen of this common European insect was found at Fitchburgh, Mass." T. v, 169. No other record of its occurrence has been observed.

12. **Nebria carbonaria** *Esch.*, var. *lyrodera* Mots.

Sitka. St. Paul's Island. Kamtschatka. T. iii, 104; Heyden, 13; Col. Am., 98.

13. **N. bifaria** *Mann.*, *carbonaria* ‡ Mann.

St. Michaels. Alaska. St. Paul's Island. Kamtschatka. T. iii, 103; Heyden, 13; Mann., 1852 and 1853.

14. **N. nivalis** *Payk.*

Said to occur in Greenland, T. iii. 103. Arctic Europe; common in Scotland. Heyden, 14, Bull. U. S. G. Surv. vol. iv, No. 2, p. 479.

15. **Clivina fossor** *Lin.*, *collaris* ‡ Lec., *elongata* || Rand., *Randalli* Lec.

This species occurred on the sea-coast near Boston, Mass., and was probably introduced. Cincinnati, Ohio, *Dury*. Inhabits Europe, and Siberia to Kamtschatka. Heyden, 15.

16. **Nomius pygmæus** *Dej.*

"Occurs under stones, etc., in moist places, in various parts of southern Europe, where it seems rare, and in many places in our country from Georgia to California." T. ix, 130; An. Lyc., iv, 208, Ottowa, Canada, Lake Superior, Alabama.

17. **Bembidium** *paludosum* Panz., **littorale** *Oliv.*, *lacustre* Lec.

Inhabits the Lake Superior region; Ohio, *Dury;* New York, *Reinecke;* Oregon, *LeConte*. Europe. Western Siberia. Mots., 272; Heyden, 52.

18. **B. rupestre** *Linn.*, *femoratum* Gyll., *tetracolum* Say, var. *rupicola* Kirby.

This species is widely distributed, though it occurs mostly in restricted localities. I have it from Canada, Colorado, and take it here. New York, *Reinecke;* Hudson Bay region, *Kirby;* Lake Superior region. Europe. Western Siberia. Mot., 244; Heyden, 50.

19. **B. Grapei** *Gyll.*, *nitens* Lec., *picipes* ‡ Mann.

This species extends from New Hampshire to Alaska (New York, Lake Superior, Fort Simpson on the McKenzie River); northern Europe. L. S. 211; An. Lyc. iv, 465; Pr. 1860, 316; Seliwaninskoj, an island in the Jenisei, lat. 65° 55′. Nord. 21; Heyden, 222.

20. B. *undulatum* Sturm., dentellum *Thunb.*

I take this species abundantly in swampy places, where there is grass and rubbish. It also occurs in Alaska, Mann., 1853; Can. Ent. xx, 61. Europe. Western Siberia. Mots., 269; Heyden, 51.

21. B. assimile *Gyll., frontale* Lec.

Taken abundantly with the preceding. This species extends from Florida to New Mexico, and northward to Lake Superior. Europe. West Siberia. An. Lyc. 462; Can. Ent. xx, 61; Mots., 263.

22. B. quadrimaculatum *Lin., oppositus* Say.

This species occurs abundantly nearly every place in the United States and Canada. Europe. Arctic and all Siberia. Mots., 250.

23. Tachys nanus *Gyll., inornatus* Say, *Tachyta picipes* Kirby.

Found abundantly under the bark of dead trees throughout the United States and Canada, likewise in Europe and Siberia. Mots., 238; Col. Am., 91.

24. Patrobus septentrionis *Dej., tenuis, rufipes* Lec., *hyperboreus* Dej., *longiventris* Mann., *? fossifrons* Esch., *? foveicollis* Esch. (Unalaschka), *? obtusiusculus* Chaud. (Hudson Bay), *? stygicus* Chd. (New Foundland), *lacustris* Mots.

This species inhabits Arctic America and southward to northern Michigan and Mt. Washington, N. H. A certain amount of local variation has caused much synonymy. Arctic and the mountains of central Europe. W. and E. Siberia; *fossifrons* Esch. = *cinctus* Mots., inhabits Kamtschatka and Ochotsk. T. v, 130 and 248; Mots., 130; Col. Am., 91; Heyden, 25.

25. Trechus rubens *Fab.*

Occurs in Nova Scotia and northern Europe T. v, 131. Ottowa, Canada, *Harrington in lit.*

26. Pterostichus punctatissimus *Rand., cancellatus* Mots., *Schrenki* Morawitz.

This fine species occurs from Maine to Hudson Bay and westward (Massachusetts, New Hampshire, Lake Superior, Canada, Hudson Bay, LeConte Cat.). Arctic Siberia, the Amur, Dauria. Heyden, 36; Bull. B. v, 39; LeConte Cat.

27. P. vitreus *Dej., Maeklini* Lec., *oblongopunctatus* Geb. (*nec* F.)

Inhabits Alaska and California. Boreal Europe. W. and E. Siberia to Kamtschatka. Mots., 155; Heyden, 35; Bull. B. v, 40.

28. P. mandibularis *Kirby, ochoticus* Sahl., *fastidiosus* Mann.

This species is spread from Alaska to Hudson Bay, and southward to Lake Superior, Vermont and Massachusetts. Arctic Siberia

(Ochotsk, the islands at the mouth of the Jenisei and some of its tributaries). Col. Am., 93; Heyden, 35; LeConte Cat. Pr. 1873, 315.

29. P. empetricola Dej., var. *frigidus*, Dej.

Sitka. Kenai. Hudson Bay Territory; var. *frigidus* occurs in Kamtschatka and the islands at the mouth of the Jenisei. Pr. 1873, 315; Heyden, 35.

30. Amara Eschscholtzii *Chaud.*

Alaska, Colorado, high peaks of the Rocky Mountains (Ulke). Kamtschatka. Heyden, 40, P. vii, 348.

31. A. melanogastrica *Dej.*

Alaska. Kamtschatka. Heyden, 40; P. vii, 348.

32. A. hyperborea *Dej.*, *obtusa* Lec., *Eschscholtzii* Mann., *longicollis* Mots.

Alaska, Rocky Mountains at 14,000 feet (Bowditch). Arctic Siberia. Kamtschatka to eastern Dauria. Col. Am., 95; Heyden, 40; P. vii, 348; T. v, 127.

33. A. apricaria *Payk.*

"Occurs in Canada, *fide* Putz. and may be the same as *Putzeysii* Horn." *Horn in litt.* Europe. Common throughout west Siberia. Arctic and east Siberia. Turkestan. Crimea. Mots., 179; Heyden, 40; Chaud., 221.

34. A. littoralis *Mann.*

Sitka. Kamtschatka. P. vii, 351; Heyden, 37.

35. A. erratica *Dupt*, *lævipennis* Kirby, *vulgaris* ‡ Kirby, *inepta*, Lec.

The determination of this species is more or less opinionative in this country and in Europe. I obtained from Europe specimens from three sources all purporting to be authoritatively determined, but evidently belonging to as many distinct species. As named in our literature, it is widely distributed across the northern part of the continent (Hudson Bay to Alaska, and south to Vermont, Lake Superior, and down the Rocky Mountains to New Mexico). P. 351 and 353. Pr. 1873, 324; Saostrovin. Arctic Siberia. Mongolia. Turkestan. Heyden, 38.

36. A. interstitialis *Dej.*, *inæqualis* Kirby, *splendida* Hald.

This species is variable in color and elytral sculpture. It is distributed from Pennsylvania to Hudson Bay, to Fort Simpson on the McKenzie River, and southward through the Rocky Mountains to

New Mexico. Arctic Europe. Kamtschatka. Arctic Siberia. Lake Kidsi. P. vii, 353; LeConte Cat.; Heyden, 38; *bipartita*, Mots., Irkutsk; *borealis* Mots., Turkestan. Col. Am., 96.

37. A. **brunnea** *Gyll.*, var. *Lapponica* Sahlb., *Sahlbergi* Zett., *amplicollis* Mann.

Alaska. Northern and central Europe. Siberia (Irkutsk, on the Lena), Pupkowskii on the Jenisei, lat. 64° 49′. Mann., 1853; Heyden, 39 and Nord. 21.

38. **Licinus silphoides** *Fab.*

This European species has been taken alive in Massachusetts, but whether it breeds in this country is uncertain. Pr. 1873, 324; T. viii, p. xix.

39. **Badister bipustulatus** *Fab.*

Two specimens occurred on Vancouver Island, B. C. As this species reaches high latitudes in Europe and Asia, possibly it may have passed over to Alaska and southward, like many others. T. viii, 165; Mots., 141; Heyden, 24; Chaud., 228.

40. **Pristonychus complanatus** *Dej.*

This species, native in central Europe, transported by commerce, has occurred on both sides of the continent, but does not appear to be properly naturalized, except in California.

41. P. *terricola* Hbst., **inæqualis** *Panz.*

This species has likewise been introduced from Europe, but does not seem to spread. I have never seen a native specimen of this nor the preceding. Occurs also in California (cab. Horn).

42. **Platynus bicolor** *Dej.*, *marginellus* Lec., *castaneipennis* Mots., *fallax* Moraw.

Mount Washington, N. H. (*Austin*), Fort Simpson on the McKenzie (*LeConte*), California. Kamtschatka, the Amur to west Siberia, the Obi. Pr. 1860, 315; Col. Am., 97; Mots., 134; Heyden, 30.

43. P. (*Anchus*) *pusillus* Lec., **oblongus** *Fab.*

This species extends across the northern part of the continent (Massachusetts, New York, Canada, Michigan, Illinois, Kansas, Oregon). Central and northern Europe. Spirina in Arctic Siberia, E. and W. Siberia. T. ix, 142; Can. Ent., xx, 61; Mots. 133; Heyden, 28.

44. **P. impressus** *Panz.*, var. *splendidulus* Mots.

The variety occurs at Sitka and Kamtschatka according to Motchulsky, Mot. 138. P. perforatus *Lec.* described from Methy, Hud. Bay Terr., on comparison, may prove to be this species. LeConte (Bull. B. ii, 52), *P. impressus* inhabits Arctic, western and eastern Siberia to Kamtschatka; also Europe. Heyden, 28; Heyden, 1886.

45. **P. Mulleri** *Hbst.*, *parumpunctatus* Fab., *planipennis* Mot.

If the last synonym is correct, as per Munich Cat. 374, this species occurs at Sitka. Siberia (Tobolsk). Arctic and central Europe. This is a fine species. Bull. B. ii, 52; Mot. 137; Heyden, 28.

46. **P. Bogemanni** *Gyll.*, *borealis* Mot., *obsoletus* Say, *placidus* ‡ Lec., *strigicollis* Mann.

Dr. LeConte hesitated to unite *obsoletus* with *Bogemanni*, having only one specimen of the latter for comparison. I have compared six individuals from Sweden with about fifty of *obsoletus* with the result of discovering no permanent character by which they may be separated. *Obsoletus* is distributed generally throughout the United States, Canada and British Columbia to Alaska. Northern Europe. Eastern Siberia. Salair, western Siberia. Bull. B. ii, 52; Heyden, 30.

47. **P. quadripunctatus** *Dej.*, *stigmosus* Lec., *octocolus* Mann.

This species is abundant in New York, Canada, Michigan, Wisconsin, Lake Superior region, Alaska and the Rocky Mountains to New Mexico. Central and northern Europe. E. and W. Siberia. P. vii, 58; Bull. B. 57; Mots. 140; Heyden, 30; Chaud. 226. *P. octocolus*, according to Heyden, is not a synonym of 4-*punctatus*, but is placed in the subgenus *Batenus* Mots. It occurs from Dauria to Kamtschatka. Heyden, 28.

48. **Blechrus nigrinus** *Mann.*, *linearis* Lec.

According to Horn (T. xiii, p. ix) this species is "very probably B. glabratus *Dufts.*" It occurs in Canada, New York, Michigan, Wisconsin, the Rocky Mountains, California, Vancouver. T. x, 134. *B. glabratus* inhabits central and northern Europe. Not rare in the Kirg. Steppes and in Siberia. Mots. 60; Heyden, 17.

49. **Plochionus pallens** *Fab.*, *valens* Lec., *Bonfilsii* Dej.

This species is not of common occurrence in the interior, but being "diffused by commerce over the entire globe, it is found near all cities of our sea-board visited by foreign vessels." Horn, T. x, 146.

50. Miscodera arctica *Payk.*, *erythropus* Mots. (Mots. 76; described and figured) *americana* Mann., *Hardyi* Chaud.

This species occurs in the northern parts of America from Alaska to New Foundland. Northern Michigan, *Schwarz.* Horn writes of the various names (T. ix, 168): "It is all one species varying in size and brilliancy of surface in the different localities." Europe (the mountains of Britain, the Alps, Boreal Europe). Eastern Siberia, the Amur. Heyden, 24; Col. Am. 91.

51. Stenolophus ochropezus *Say*, *limbatus* Mann., *convexicollis* Lec., *gracilis* Casey.

This species extends from Arizona to the Atlantic, and north to Canada. I have specimens from New Mexico and Colorado. In many places it is abundant. *Limbatus* occurs in Kamtschatka. Bull. B. vi, 15; Heyden, 47.

52. Bradycellus cognatus *Gyll.*, *Deutschii* Sahlb., *nitens* Lec., *axillaris*, *longiusculus* Mann.

This insect occurs in North America in widely separated localities (San Diego, Calif., *LeConte;* Mt. Washington, N. H., *Austin;* Nova Scotia, *Harrington, in lit.* Northern Michigan and Lake Superior, *Schwarz;* Alaska, Sitka. Arctic Siberia. Arctic Europe, Britain, Germany. Pr. 1868, 380; Heyden, 42.

HALIPLIDÆ.

53. Haliplus ruficollis *DeG.*, *impressus* ‡ Kirby, *immaculicollis* Harris.

This species has a wide distribution. From the Southern and Middle States, northward through Canada to Hudson Bay and westward to New Mexico and the Rocky Mountains. General in Europe, passing over to Turkestan and western Siberia. T. iv, 385; Kirby, 66; Heyden, 53.

DYTISCIDÆ.

Obs.—Hydrovatus cuspidatus *Kunze.*

Dr. Sharp says that the species known by this name in our literature is *pustulatus* Mels., and not the true *cuspidatus.* Sharp, 323.

54. Cœlambus inæqualis *Fab.*, *punctatus* Say.

This species is a little variable in color ornamentation. It occurs here abundantly and generally throughout the Middle and Western States (Buffalo, N. Y.; Ottawa, Canada; Lake Superior, Michigan, Ohio, Illinois, Kansas, Colorado). Abundant in northern and cen-

tral Europe. Sh., 395; Turkestan, Heyden, 53; Algeria Wehnke (Sh.). T. iv, 387; var. *punctatus* is the form most commonly met with.

55. C. impressopunctatus *Schall., similis, picatus* Kirby, *nigrolineatus* ‡ Kirby. 4 *lineatus*, Mann., *porosus* Gebl.

This species is apparently less abundant than the preceding. It occurs in Massachusetts, New York, Canada, Michigan, Illinois, Lake Superior, Hudson Bay region, Sitka. Europe. Asia Minor, northern and southern Siberia. T. iv, 389; Col. Am. 100; Sh. 403; Heyden, 54.

56. Deronectes depressus *Fab., rotundatus* Lec.

This species occurs in Canada, *Harrington;* New York, *Reinecke;* Michigan, *Schwarz.* Europe to 68° 20′, in Lapland. S. iv, 392; Sh., 428.

57. D. griseostriatus *DeG., ?(catascopium, interruptus, parallelus* Say, *prosternalis, suffusus* Sharp).

Thus constitued the species extends across the northern part of the continent from Labrador to Alaska (Labrador *Packard*, Hudson Bay region, *Kirby;* Alaska, California, Kansas, Lake Superior, *LeConte;* Michigan, *Schwarz;* New York, *Reinecke.* My specimens are from Colorado and Massachusetts. Alpine and northern Europe to 69° in Finland. Arctic Siberia (Dudinka). T. iv, 393; T. x, 277; Sh., 435; Heyden, 54.

58. Hydroporus alpinus *Payk.*, var. 12-*lineatus* Lec., ? *lævis* Kirby, var. *borealis* Gyll.

Occurs at Lake Superior. Canada; *lævis*, Hudson Bay region. Lapland and Norway to 68°. Arctic Siberia. T. iv, 391; Sh., 448; Heyden, 54.

59. H. septentrionalis *Gyll., scitulus* Lec.

Lake Superior (*LeConte, Schwarz*). The mountains and northern parts of Europe. Eastern Siberia, the Amur, Dauria. P. vii, 295; Sh., 449; Heyden, 54.

60. H. rivalis *Gyll., obesus* Lec., *congruus* Lec., *Sanmarki* Sahlb.

This species is described from California and from Colorado (Florissant at 8000 feet). Arctic Europe to 68° 50′. Central Europe. Arctic Siberia (Dudinka and Chantaika Rivers, affluents of the Jenisei, 69° 30′ to 72°). Sh. 449; Heyden, 54.

61. H. obscurus *Sturm.*

This species is, so far, unknown here, but Sharp saw two specimens in Mr. Andrew Murray's collection said to be from North America. Northern and central Europe. Arctic Siberia (Chantaika River and Tschornaja Island). Sh., 459; Heyden, 55.

62. H. fuscipennis Kies.

Alaska. Northern Europe (Sweden, Finland, Germany). Chantaika River, Arctic Siberia. Sh., 461; Heyden, 55.

63. H. glabriusculus *Aube.*

Sharp refers a specimen from Massachusetts to this species as a variety, otherwise it is probably unknown here. "Lapland, Angora, eastern Siberia." Sh., 470.

64. H. tartaricus *Lec., nigellus* Mann.

Described from Lake Superior, but not known to have occurred there since. My specimens are from Montrose County, Colorado, at 10,000 feet altitude (*Bowditch*). Hudson Bay (*LeConte Cat.*). Arctic Siberia (the Jenisei from 69° 30′ to 72°). Sh., 470; Heyden, 55; Mann., 1853.

65. H. *atriceps* Crotch, morio *Sharp, melanocephalus* Marsh ‡

This species occurs in the White Mountains, New Hampshire (*Sharp*). Finland to 69°. Scotland. Arctic Siberia (Obi, Jenisei). Sharp, 471; Heyden, 55.

66. H. tristis *Payk., varians* Lec., *subtonsus* Lec., *ruficapillus* Mann.

This species extends across the northern part of the continent from Massachusetts to Alaska (Vermont, Canada, Michigan, Lake Superior, Hudson Bay (*LeConte Cat.*). Northern Europe to 69° in Finland. Arctic Siberia (the island of Tschornaja); Kirg. Steppes. P. vii, 297; T. iv, 395; T. x, 278; Sh. 472; Heyden, 55.

67. H. vittulus *Er.*, ?striola *Gyll.*

This species occurs in British Columbia (*fide* Sharp). Northern Europe. Asiatic Siberia, in the northern affluents of the Jenisei. Sh., 474; Heyden, 55.

68. H. oblongus *Steph., conoideus* Lec.

This species is not commonly found. Canada, Lake Superior (*LeConte*), Port Huron, Mich. (*Schwarz*), Vancouver. Northern Europe to 66° 20′ in Finland. Arctic Siberia in the Kurej River. T. iv, 396; Sh., 485; Heyden, 54.

69. Ilybius ater *DeG., ungularis* Lec.

This species is probably rare here, as I know of no one who has taken it. Middle States (Pennsylvania), *LeConte*. Europe (the mountainous parts and north to 63° 40′ in Finland). West Siberia. T. iv, 411; T. x, 279; Pr. 1862, 521; Sh., 550; Heyden, 57.

70. I. subæneus *Er.*

(Hudson Bay; Canada) *fide* Sharp. Europe (Germany; France to 69°). Arctic Siberia (northern tributaries of the Jenisei). Sh., 552; Heyden, 57.

71. I. angustior *Gyll., picipes* Kirby.

Widely distributed, but infrequently recognized. Labrador, Hudson Bay region 54° to 65°. Canada, northern Michigan, Lake Superior, Kansas, Alaska. Germany. Sweden. Finland to 69°. Kamtschatka, the northern tributaries of Jenisei, southwestern part of western Siberia. Kirby, 72; T. iv, 411; T. x, 279; Sh., 556; Heyden, 57.

72. I. fuliginosus *Fab.*

North America (*fide* Sharp). Central and northern Europe to 64° in Finland. Southeastern west Siberia. Sh., 556; Heyden, 57.

73. Agabus (*Gaurodytes*) congener *Payk., ambiguus* Say, *discolor* Harris (T. x, 278), var. *lapponicus* Sahlb.

Thus constructed the range of this species is Pennsylvania, Massachusetts, Labrador (Caribou Island, *Packard*), Greenland, Hudson Bay. White Mountains, N. H. Central and northern Europe. Arctic and western Siberia. Sh., 512; Heyden, 56. "A variable species," *Sharp*.

74. A. dissimilis *Sahlb., ? longulus* Lec.

Specimens of this species were so determined by Dr. Sharp for Dr. Horn, although in his Dytiscidæ (p. 513) he is not quite certain of the distinctness of the species from congener *Payk.* Should the two species prove identical the distribution would be Europe; Siberia; Hudson Bay; Greenland; Labrador; and Lake Superior. Stupart's Bay, Hudson Straits, *Harrington*.

75. A. confinis *Gyll., bicolor, phæopterus* Kirby, *ovoideus* Crotch (T. x, 278).

Kansas, Lake Superior (*LeConte*), Michigan (*Schwarz*), Canada (*Pettit*), Vermont, collected by Mr. C. Roberts; Hudson Bay (*Kirby*), Alaska. Sweden; Finland to 68°. West Siberia. T. iv, 418; Sh., 520; Heyden, 56.

76. A. arcticus *Payk., reticulatus* Kirby, var. *sibiricus* Sahlb.

Taken at 65° north latitude (*Kirby*), Labrador (*LeConte*), northern Europe to 69° in Finland. Arctic Siberia (the Dudinka). T. v, 422; Sh., 526; Heyden, 56.

77. A. *nigroæneus* Er., Erichsoni *Harold, lutosus* Cr. (T. x, 279).

California, Kansas, Slave Lake, Lake Superior, Canada, Hudson Bay, central and northern Europe. Siberia (the islands and affluents of the Jenisei). T. v. 419; Sh., 529; Heyden, 56.

78. A. tristis *Aube*, var. *dubius* Mann., *? atratus* Mann.

Occurs in New Mexico (*Snow*); Colorado (*Schwarz*); Lake Tahoe, California; Alaska; Arctic Siberia (the Dudinka). T. iv, 422; Sh., 531; Heyden. "This species varies a good deal in color," *Sharp.*

79. Rhantus notatus *Fab., sericans* Sharp (T. x, 279), *suturalis* Lac., *roridus* Mull.

This species has been found in Kansas (*Snow, LeConte*), Montana (*LeConte*), British Columbia. Europe. Western Siberia Pr. 1866, 366; Sh., 619; Heyden, 57; Nord., 22.

80. R. bistriatus *Berg., suturellus* Harr.

This species occurs in Massachusetts, Illinois, Kansas, at Lake Superior, Slave Lake, Hudson Bay. Central and northern Europe. E. and W. Siberia. T. iv, 409; Sharp, 620; Heyden, 57 (*suturellus* Harris). *Adspersus* Fab. is not a synonym of *bistriatus* Berg. *Sharp.*

Some other American and Eastern forms if not identical seem very close, viz., *sinuatus* Lec. and *Grapii* Gyll. scarcely differ, except that the latter is a little larger (Sh. 617).

81. Colymbetes Paykulli *Er.*

No reference to this species has been observed in our literature. Dr. Sharp (625) gives as its habitat "western North America," north Germany; Sweden; Finland to 68° 30′; Arctic Siberia (Fadjanowsk). "Excessively near seminiger *Lec., inæqualis* Horn;" *Horn in litt.* Saskatchewan River, B. C. Susanville, California.

C. obscuratus Mann. is possibly identical, the chief difference being that the transverse striolæ of the elytra are somewhat finer and denser (comparison by Mannerheim, 1853), quite a secondary character.

82. C. Thomsoni *Sharp.*

Lapland. Iceland (? Greenland). Sh., 628.

83. Eretes *Sh.*, 628 (*Eunectes*), sticticus *Linn.*

This species is more extensively distributed than any known Dytiscide. Sharp gives its distribution as follows: "France, Corsica, Sardinia. Spain. Africa. Siberia. Japan. Formosa. China. Philippines. Timor. Sumatra. Java. Pulo Penang. Siam. India. Arabia. Mesopotamia. Canary Islands. Madeira. Cape Verde Islands. U. S. N. A. Mexico. Peru. Guadaloupe. Galapagos." Australia may, perhaps, be added. It is not known at many places in the U. S. A., but occurs in Kansas (*Snow*), Texas and at Vallecitas, California. T. iv, 386; Sh., 699; Turcomania, Heyden, 58.

84. Hydaticus stagnalis *Fab.*, *cinctipennis* Aube, *modestus* Sharp, *americanus* Sh. (T. x 280)

As thus constructed this species varies in color ornamentation. It occurs in New York, Michigan, Illinois. My specimens (*modestus*) are from Wisconsin, Red River, *Sharp*. Northern Europe. Western Siberia. T. iv, 404; Sh., 650–52; Heyden, 59.

85. H. lævipennis *Thomp.*

Comparing this with *stagnalis* Dr. Sharp, l. c. says: "They are perhaps not distinct species," giving Red River [Manitoba], Sweden and Finland to 60° 30′ as its habitat.

86. Dytiscus marginalis *Linn.*

Occurs in Canada and northern Michigan. Dr. Sharp has a specimen labeled by Castelnau "Am. Bor. int. mont. rocheuses," and found another in Murray's collection said to be from North America. Widely distributed in Europe to 68°. W. and E. Siberia. Japan. Sh., 641; Heyden, 58.

87. D. circumcinctus *Ahr.*, *circumscriptus* Lac.

Dr. Sharp had specimens from Red River, [Manitoba]. Europe to 61° 50′ north, in Finland. Northern Siberia. Sh., 642; Heyden, 58. *D. anxius* Mann. is possibly synonymous. It occurs in Oregon and Sitka. T. iv, 408; also in Canada and Hudson Bay region. *Horn, in litt.*

88. D. dauricus *Gebl*, *confluens* Say, *diffinis* Lec., *Franklinii* Kirby, *Ooligbukii* Kirby.

This species extends across the northern part of the continent from Maine to Alaska (Maine, Hudson Bay (*LeConte Cat.*), Great Bear Lake River, Lake Superior, Michigan, Wisconsin, Kansas, Colorado (Pagosa), Alaska (Sitka). Kamtschatka; Dauria. T. iv, 407; P. 1868, 370–72; Sh., 643; Heyden, 58.

89. Graphoderes *fasciatocollis* Harris, cinereus *Linn., elatus perplexus* Sharp (T. x, 280).

Inhabits Pennsylvania (*here*), New York, Massachusetts, Michigan, northern California, Washington Territory, Red River, [Manitoba.] Europe. West Siberia. Turkestan. T. iv, 403; Can. Ent. xx, 62; Sh., 693–95; Heyden, 59.

GYRINIDÆ.

90. Gyrinus minutus *Fab.*

This appears to be a northern species. Square Island, Labrador *Packard;* Hudson Bay region, *Kirby;* Lake Superior, Michigan, Washington Territory, from which I have specimens. Central and northern Europe Arctic, west and east Siberia (Spirina, the Chantaika River, Omsk). Pr. 1868, 372; Heyden, 60.

Obs.—G. Rockinghamensis *Zimm.* seems to differ only by having the underside entirely pallid, but is approached in this respect so closely by individuals of *minutus* as to render the separation opinionative. It is abundant from New York to Florida.

91. G. marinus *Gyll.*, var. *dorsalis* Gyll., var. *opacus* Sahlb.

The variety *opacus* occurs in Greenland (Pr. 1868, 372), but further record of its occurrence in America has not been observed. Central and northern Europe. Many places in Arctic, east and west Siberia and Turcomania. Heyden, 60.

HYDROPHILIDÆ.

92. Helophorus granularis *Linn.*

This species seems to have only a catalogue record in our literature. There are many varieties in Europe. It occurs in west Siberia; Mongolia; Turkestan. Heyden, 61.

93. H. tuberculatus *Gyll., scaber* Lec.

This species is "very abundant at Lake Superior," *LeConte.* New York, Canada, Michigan, Wisconsin. Germany, northern Europe. Siberia (the Obi and Jenisei). Mongolia. P. vii, 358; Heyden, 61.

94. Tropisternus apicipalpis *Chev.*

This species "occurs in Arizona, the peninsula of California, and in Mexico," Horn, Can. Ent. xvii, 138. It also inhabits southern France.

95. **Hydrobius fuscipes** *Linn., seriatus insculptus, regularis* Lec. (P. vii, 372).

Very variable and widely distributed in temperate and boreal America. Alaska to Hudson Bay, southward to California; through the Rocky Mountains to New Mexico. On the Atlantic slope it extends south to Maryland and West Virginia, from which I have specimens. General in Europe. Kamtschatka, east and west Siberia. Turkestan. P. Am. P. xiii, 135; Heyden, 62.

96. **Sphæridium scarabæoides** *Linn.*

A specimen of this species was once taken in Canada (C. 73), but its subsequent occurrence is unknown. It is quite common throughout Europe, and is found in many places in Turcomania, east and west Siberia. Heyden, 63; Heyden, 1885.

97. **Cercyon.**

The species of this genus are mostly neglected by collectors in this country, as it has not yet been studied by any of our systematists, hence the record of the distribution of the species is very meagre, and fails to furnish more than a remote approximation.

98. **C. flavipes** *Fab.*

Michigan (Detroit; Marquette), *Schwarz.* I take it here in Pennsylvania. Europe. West Siberia (Kurejka). Heyden, 63.

99. **C. melanocephalum** *Linn.*

Europe. Asia (Iekatrinburg, in eastern Ural). Heyden, 63.

100. **C. centrimaculatum** *Sturm., Mundum* Mels.

District of Columbia, *Ulke;* Pennsylvania, Michigan (Detroit and Marquette), *Schwarz.* Central and northern Europe. P. vii, 374.

101. **C. pygmæum** *Ill.*

Ottawa, Canada, *Harrington;* Vermont, *Roberts.* Europe. Vorogova, on the Jenisei, in Arctic Siberia, west Siberia. Heyden, 63.

102. **C. unipunctatum** *Linn.*

Michigan, *Schwarz;* Canada, *Harrington.* I have seen it here several times in great abundance under carrion, or putrid substances. Europe. Asiatic Siberia (Kolmogorova), west Siberia. Heyden, 63.

103. **C. anale** *Payk., maculatum* Mels.

Pennsylvania, Michigan. Europe. East and west Siberia on the Obi and Jenisei. P. vii, 374. Heyden, 63; Nord., 22.

PLATYPSYLLIDÆ.

104. **Platypsyllus castoris** *Rits.*

The systematic position of this curious insect seems to be now finally settled. "First discovered on the American beavers in the Zool. Gardens at Amsterdam. It is now known to inhabit the beavers of Texas, Nebraska, the Hudson Bay region, Alaska, and those taken in France at the mouth of the Rhone (*Horn*)." T. xv, 23–26; T. x, 114 and plate (*LeConte*).

LEPTINIDÆ.

105. **Leptinus testaceus** *Mull., americanus* Lec., Pr. 1866, 367; T. x, 113; C. 77.

"Inhabits with field mice and other small rodents." Taken at Keokuk, Iowa, by Dr. Brendel; Washington (*Ulke* and *Schwarz*), Philadelphia (*Ryder*). My frequent searchings for this species have resulted negatively. It occurs in Sweden, Germany and France.

SILPHIDÆ.

106 **Necrophorus vespilloides** *Hbst., pygmæus, hebes* Kirby, *defodiens* Mann., *conservator* Walk., *mortuorum* Fab., *pollinctor* Lec.

The individuals of this species vary greatly in color ornamentation. It extends across the continent from Nova Scotia to Alaska (Canada, Michigan, Lake Superior; var. *pollinctor*, from Washington and Oregon; has the antennæ entirely black). Under the name *mortuorum* it inhabits east Siberia to Kamtschatka, and in Amurland. Europe. Pr. 1866, 367; T. viii, 234 and 314; Col. Am. 126; Heyden, 87; Heyden, 1886.

107. **Silpha lapponica** *Hbst., caudata* Say, *tuberculata* Germ., *californica* Mann., *granigera* Chev.

This species is widely distributed in northern and western America Labrador commonly, *Packard*). Hudson Bay region (*Lec. Cat.*). Canada; Green Mountains, Vermont; New York, Michigan, Lake Superior, Nevada, Idaho, Colorado, Kansas, Texas (El Paso), New Mexico, California (San Diego), Oregon, Washington; Alaska. Northern Europe. Arctic and boreal Siberia from Ochotsk to Nikolaevsk at the mouth of the Amur. P. vi, 278; T. viii, 238; Col. Am. 124; Heyden, 86.

108. **S. opaca** *Linn.*

This species has occurred at Lake Mono, California (*Horn*), Hudson Bay Territory, the borders of the McKenzie and Slave Rivers;

White, in Richardson's Arctic Searching Expedition, p. 474 (*Lec.*). Europe. Throughout Siberia; Amurland. Pr. 1866, 367; T. viii, 241; Col. Am., 124; Heyden, 85.

Obs.—*S. atrata* Lin., a species found throughout Europe and in western Siberia, which, when introduced here, failed to establish itself.

109. **Pteroloma Forstroemi** *Gyll.*

Alaska. Arctic and western Siberia (in Obi). Caucasus; Sweden; Germany. T. viii, 245; Heyden, 85.

110. **Sphærites glabratus** *Fab., politus* Mann.

"Occurs from California to Alaska (*Horn*)." Boreal and Alpine Europe. T. viii, 247.

111. **Colon bidentatum** *Sahlb.*

Massachusetts, *Blanchard;* New York, *Ulke*, are the localities of occurrence for this probably introduced European species. Horn, T. viii, 217.

PSELAPHIDÆ.

112. **Bryaxis [Rybaxis] sanguinea** *Leach*, ♂ *longicornis* Den.

This is stated to occur in Massachusetts, Michigan and Illinois. T. viii, 181. Europe. Siberia. Turkestan (Samarkand). Heyden, 84,

STAPHYLINIDÆ.

Of this extensive family only certain sections have yet been more than cursorily considered by American writers, and but few of the genera in any sense exhaustively. In the great tribe ALEOCHARINI the more common or conspicuous insects have alone been touched. The twenty-nine species described by Lieut. Casey added to those in Henshaw's Catalogue increases the number in this tribe to 125, while in so small a country as Britain 325 are enumerated by Dr. Sharp. In the family we have less than 1000 described species, more than one-tenth of which also occur in Europe and Asia.

113. **Hoplandria pulchra** *Kraatz.*

Common on the shores of the Indian River, Florida, *Schwarz* Central and southern Europe

114. **Homolota plana** *Gyll.*

Garland and Veta Pass, Colorado, at 9500 feet, also Florida, under pine bark, *Schwarz*. Exrope. Northern Siberia along the Jenisei. Heyden, 66; from north lat. 68° 40′ to 68° 35′; Nord., 23; east Siberia, *Solsky*.

115. H. analis *Grav.*

Michigan, *Schwarz;* Massachusetts, *Blanchard in litt.* Pennsylvania (*here*). Europe. Arctic, west and east Siberia. Heyden, 66; Nord., 23; Amurland, Heyden, 1885.

116. H. lividipennis *Mann.*

This species occurs in Pennsylvania (*here*), Ohio *Dury;* New York, *Reinecke;* Canada, *Harrington;* Michigan and La Veta, Col., *Schwarz;* Lake Superior, *LeConte;* Kansas, *Snow.* Europe.

117. H picipennis *Mann.*

Sitka. Europe.

118. H. sordida *Marsh.*

Massachusetts. *Blanchard, in litt.* Europe.

119. H. fungi *Grav*

Found by Mr. Schwarz at Veta Pass, Col., at 9200 feet. Common in Europe and Siberia. Heyden, 66; Nord., 23.

120. Tachyusa pygmæa *Sachse.*

The name, with Georgia as a doubtful locality, is the only reference to this species that has been observed. It is in European catalogues.

121. Aleochara lata *Grav.*

Occurs everywhere east from the Mississippi and in Canada. Europe.

122. A. fuscipes *Grav., lustrica* Say.

This species as well as *lata* occurs here in Pennsylvania; Ohio, *Dury;* Europe. West Siberia (Barnaul). Heyden, 64.

123. A. nitida *Grav., verna* Say, *anthomyiæ* Sprague, Am. Entomol. ii, 370.

This species is widely distributed, and abundant from Florida to Canada, and westward to the Rocky Mountains, through which it extends to Colorado and New Mexico. General in Europe, and occurs at Lake Baical in east Siberia. Heyden, 64; Amurland, Heyden, 1885.

124. Dasyglossa prospera *Er.*

Massachusetts, *Blanchard;* determined by Fauvel. Garland and Veta Pass, Col., *Schwarz.* France. Germany. Arctic Siberia (Kolmogorovo; Spirina). Amurland, Heyden, 1885.

125. Bolitochara gracilis *Sachse.*

Massachusetts, *Blanchard, in litt.* Europe.

126. **Oligota parva** *Kraatz.*

Massachusetts (*Blanchard fide Fauvel*). Found about stables. Germany. Italy. Britain.

127. **Gyrophæna affinis** *Sahlb.*

Massachusetts, *Blanchard, in litt.* East and west Siberia. Heyden, 68.

128. **Gymnusa brevicollis** *Grav*

"Canada and the Lake Superior region," C. 94. Michigan, *Schwarz.* P. Am. P., xvii, 631; Massachusetts, *Blanchard, in litt.* Central Europe. Sweden. West Siberia. Heyden, 68.

129. **G. variegata** *Kiesw.*

Michigan, *Schwarz* l. c. Central Europe. Sweden.

130. **Myllæna dubia** *Grav.*

Michigan, *Schwarz* l. c., 648. Massachusetts, *Blanchard.* Europe. West Siberia (Tobolsk). Heyden, 68.

131. **M. minuta** *Grav.*

No locality observed. Europe. Arctic Siberia (Kolmogorovo). Heyden, 68.

132. **M. infuscata** *Kraatz.*

Massachusetts, *Blanchard.* Europe.

133. **Acylophorus** *pratensis* Lec.

A specimen of this, the type, occurred in Kansas. Fauvel (Faun. Gallo-Rhen. iii, 542) places it as a synonym of *glabricollis* Grav., a common European species. Dr. LeConte (P. Am. P. xvii, 388), without comparing specimens, does not fully assent to this, but thinks Fauvel's remarks apply better to some varieties of *pronus* Er. Common on both coasts. N. S., 34.

134. **Quedius fulgidus** *Fab.*, *iracundus* Say, *groenlandicus* Zett., *erythrogaster*, *melanocephalus* Mann., *silvicola* Casey.

These names are mostly indicative of color varieties. The species extends across the northern part of the continent from Greenland to Alaska, and as far south as northern Georgia and middle California, though south from New York it is not commonly met with. Europe. West Siberia (Barnaul). T. vii, 158; Heyden, 71.

135. **Q. lævigatus** *Gyll.*, *plagiatus*, *longipennis* Mann., *rufipennis* Maek.

Likewise variable in color. "Occurs from Alaska to Oregon, Kansas, Canada and Pennsylvania," *Horn.* I take it here, and have it from Illinois and Michigan; Massachusetts, *Blanchard;* Veta Pass, Col., at 9400 feet *Schwarz.* Northern Europe. East Siberia (Irkutsk). T. vii, 163; Heyden, 71.

136. Q. molochinus *Grav.*

Common here; "occurs from New Hampshire to Vancouver and Sitkha, and as far south as northern Georgia," *Horn*. It was likewise taken by Mr. Schwarz at Veta Pass, Col., at 11,000 feet. General in Europe, Boreal Siberia. T. vii, 164; Heyden, 71.

137. Q. sublimbatus *Maek.*

"Occurs from Alaska to Fort Simpson, on the McKenzie River, and the Lake Superior region," *Horn*. Michipicoton River (*Schwarz*). Eastern Siberia *Mannerh*. T. vii, 160. Heyden, 71.

138. Staphylinus erythropterus *Linn., cæsareus* ‡ Lec., *cæsareus* ‡ Schwarz. (List of Coleopt. of lower Mich.)

One specimen occurred at Detroit, Mich. P. Am. P. xvii, 599; T. vii, 190. Common in Europe. Northern and west Siberia. Heyden, 72.

139. S. cæsareus *Cederh., ornaticauda* Lec.

A single specimen was taken in Canada by Mr. Ulke, and another near Ottawa, Canada, by Mr. W. H. Harrington (T. vii, 191; Can. Ent. xvi, 46). These two fine European species have evidently been introduced, whether to perpetuate themselves here the future will determine. Mr. Harrington took the specimen June, 1883, and writes that it has not occurred since (1889).

140. Ocypus ater *Grav.*

This species occurs here, and in many places from New Jersey to Kansas, *Snow*, and northward to Canada and Nova Scotia (*Harrington*). Europe generally.

PHILONTHI. This tribe has recently been exhaustively studied by Dr. Horn, and the American synonymy and distribution of the species as given in his monograph admits of little in addition.

141. Philonthus æneus *Rossi, politus, mandibularis* Kirby, *Harrisi* Mels., *angulicollis* Mot.

"Nearly cosmopolitan," *Horn*. Abundant here in Pennsylvania; Ohio, Michigan, New York, Massachusetts, Canada to Nova Scotia, Hudson Bay and Lake Superior, Wisconsin, Kansas, Colorado. Europe. Arctic, east and west Siberia; Amurland; Dauria. T. xi, 181. Heyden, 73; Col. Am., 121.

142. P. umbratilis *Grav.*

This species "occurs in the eastern Atlantic region, Massachusetts, New Jersey and Lake Superior," *Horn;* Michigan. Europe. West Siberia, Tobolsk. T. xi, 184. Heyden, 73.

143. P. politus *Fab.*

Unknown in our collections as native, but placed among the species of our fauna by Dr. Horn on the assurance of Fauvel having a specimen from North Carolina, and another from "Amer. Bor." Europe. Barnaul, west Siberia. Turcomania. T. xi, 186. Heyden, 74.

144. P. atratus *Grav.*

Of this species Dr. Horn writes, "I have seen but two specimens, a male without locality, and a female from Hudson Bay, both in the cabinet of Dr. LeConte." As it occurs in northern Siberia it probably will be found abundantly throughout Boreal America. Europe. East and west Siberia. Turkestan. T. xi, 187. Heyden, 74.

145. P. debilis *Grav.*

This species is found here. "It occurs everywhere in the eastern Atlantic region, extending as far west as Kansas and Nebraska," *Horn.* Garland and Veta Pass, Col., at 9400 feet, *Schwarz;* Santa Fe Cañon, New Mexico, *Snow.* Europe. Africa. West Siberia. T. xi, 194. Heyden, 73.

146. P. varians *Payk.*, var. agilis *Grav.*, *niger* Mels.

(Var. *agilis* is the American form, as determined by Fauvel. Nearly cosmopolitan. In the northern portions of the Atlantic region, extending westward to Washington and California) *Horn.* Melsheimer took it in Pennsylvania. Europe. Both forms occur in west Siberia. T. xi, 195; Heyden, 75.

147. P. longicornis *Steph.*, *scybalarius* Nord.

Cosmopolitan. Dr. Horn has seen specimens "from nearly every region in our fauna, except Arizona." Nova Scotia, *Harrington, in litt.* Santa Fe Cañon, New Mexico, *Snow.* Europe. Koultoe, east Siberia. T. xi, 196; Heyden, 75.

148. P. discoideus *Grav.*, *ruficornis* Mels.

This species, according to Dr. Horn, occurs everywhere in the Atlantic region, extending to Nevada and Arizona. All Europe and the circum-Mediterranean region. Turkestan. P. xi, 196; Heyden, 73.

149. P. thermarum *Aube.*

Only three specimens were known by Dr. Horn to have been taken in our fauna, collected in Missouri and the District of Columbia, Massachusetts, *Blanchard, in litt.* Europe. T. xi, 196.

150. P. quisquiliarius *Gyll.*

Is said by Fauvel to occur in California, but Dr. Horn never had seen a native specimen. Europe. Vorogova, on the Jenisei, in Arctic Siberia; Barnaul, west Siberia. T. vi, 197; Heyden, 74.

151. P. fulvipes *Fab.*

"Occurs in Canada, Massachusetts, Michigan, New York," (*Horn*) New Jersey. Europe. West Siberia. T. xi, 200; Heyden, 75.

152. P. micans *Grav.*

"Occurs in the eastern United States from Massachusetts to Michigan," *Horn;* Florida, *Schwarz;* Canada, *Harrington.* Europe. Tobolsk, west Siberia; Turkestan. T. xi, 204; Heyden, 75.

153. P. cyanipennis *Fab., cæruleipennis* Mann.

This beautiful coleopter is found abundantly in living fungi; according to Dr. Horn it occurs over the entire eastern United States, but had not been seen from west of Kentucky. Canada, *Harrington.* It seems common in many countries of Europe. Eastern Siberia; Amurland; Dauria. T. xi, 208; Heyden, 73.

154. P. sordidus *Grav.*

"Occurs in Canada, Michigan, Colorado, Vancouver and California," *Horn.* This species is found here in Pennsylvania. Europe. Jenissiesk, west Siberia. T. xi, 209; Heyden, 73; Amurland, Heyden, 1885.

155. P. cephalotes *Grav.*

According to Dr. Horn this species is scarcely separable from *sordidus*, and is nearly cosmopolitan. In our fauna he had seen only a few specimens from Massachusetts and the Middle States. Kolmogorovo and Lebedevo, Arctic Siberia; west Siberia. T. xi, 210; Heyden, 73; Amurland, Heyden, 1885.

156. P. ventralis *Grav., anthrax* Grav.

"Occurs in Michigan, Missouri and Nevada," *Horn;* New York, *Reinecke.* Europe. Africa. Siberia. T. xi, 211; Heyden, 73.

157. P. nigritulus *Grav., aterrimus* Grav., *picipennis* Maek., *pumilus* Mann.

"Occurs from Vancouver to Arizona, Lake Superior and the New England States," *Horn.* Sitkha and Kadjak. Florida and Veta Pass, Col., at 9200 feet, *Schwarz.* It occurs here very abundantly on the borders of stagnant ponds, and in marshy places. Europe. Arctic, west and east Siberia. Turkestan. T. xi, 217; Heyden, 74. When *nigritulus* is mentioned in our literature it is

sometimes uncertain whether it or *micropthalmus* were in view, a very closely allied species with which, till now, it has been mostly confused.

158. Actobius cinerascens *Grav.*

This species is found here in Pennsylvania occasionally on the banks of streams; "from Michigan to Florida," *Horn;* Massachusetts, *Blanchard.* Europe generally. T. xi, 225.

159. Cafius sericeus *Holme.*

This species common in Europe and the basin of the Mediterranean, has occurred in America The specimens seen by Dr. Horn were without certain locality, but possibly from Coney Island, near New York. T. xi, 238.

160. Xantholinus fulgidus *Fab.*

This species has been introduced from Europe, where it is common. It seems to be rare here, the only native specimen I have seen was taken by myself in this city on the street. T. viii, 172. Taken by Mr. F. Blanchard in Massachusetts in a green-house; *Blanchard, in litt.* and in the vicinity of New York City (*Horn*).

161. X. punctulatus *Payk.*

This species is said by Fauvel to occur in North America, but native specimens had not been seen *LeConte.* Europe. Tobolsk, west Siberia. T. viii, 172; Heyden, 75.

162. Leptacinus batychrus *Gyll., flavipes* Lec.

"Middle and Western States, rare," *LeConte;* Florida, rare, *Schwarz.* Massachusetts, *Blanchard.* Europe. Lake Baical, east Siberia. N. S. 41; T. viii, 168; Heyden, 75. Amurland, Heyden, 1885.

163. L. parumpunctatus *Gyll.*

This European species, according to Fauvel, occurs in North America. T. viii, 169.

164. Dianous cærulescens *Gyll., chalybeus* Lec.

My specimens are from Marquette, Mich., where the type of *chalybeus* was found. Mr. Harrington has it on his list of Ottawa, Can. Coleoptera, and Mr. Blanchard has taken it in Massachusetts. N. S. 49. Europe.

165. Stenus bipunctatus *Er., comma* Lec.

This species is widely distributed. It occurs here abundantly among herbage near water. I have specimens from Vancouver

Island, B. C.; Ohio and Kentucky, *Dury;* Washington Territory, *Casey;* "Middle and Western States; not rare," *LeConte.* N. S. 50; Casey, 14. Europe. Numerous places in west Siberia. Heyden, 78.

166. S. juno *Fab.*

This species extends across the northern part of the continent from Vermont to Vancouver Island, but is not recorded southward from New York. Europe. Arctic, east and west Siberia. Casey, 25; Heyden, 77.

167. S. pumilio *Er., atomarius* Casey.

The synonymy in this and the species of *Stenus* that follow charged to Mr. Casey is due to Mr. A. Fauvel, to Mr. F. Blanchard (T. xiii, p. xiii), "Cambridge, Mass.; Detroit, Mich.," Casey. Europe, Germany. Siberia. Kurejka. Heyden, 78.

168. S. nanus *Steph., pusio* Casey.

"Massachusetts; Canada; Lake Superior," *Casey.* Europe. Arctic and eastern Siberia. Heyden, 78; Casey, 82.

169. S. humilis *Er., mammops* Casey.

This species extends across the continent from Massachusetts to British Columbia and southward through the Rocky Mountains to New Mexico. Europe generally. Arctic and Middle Siberia in the basin of the Jenisei; Amurland, Casey, 98; Heyden, 78. Heyden, 1885.

170. S. canaliculatus *Gyll.*

Massachusetts, Lake Superior, Canada. Europe in general. W. Siberia along the Irtysch and Jenisei. Casey, 115; Heyden, 78.

171. S. congener *Maekl.*

European authorities place this as a synonym of *canaliculatus*, but Mr. Casey says they are "very distinct." Casey, 114. It occurs in Alaska and Siberia. If Mr. Casey's opinion is confirmed it may perhaps lead to a modification of the European and Asiatic distribution given under *canaliculatus.*

172. S. morio *Grav., subgriseus* Casey, ? [*enodis* Casey.]

California, British Columbia, Casey, 128; Alamedo, Garland and Veta Pass, Col., at 9200 feet, *Schwarz.* Europe. Arctic Siberia (the Jenisei and Obi). Heyden, 78; Amurland, Heyden, 1885.

173. S. tarsalis *Ljungh, reconditus* Casey.

Mr. Casey doubts this synonymy, Bull. vi, 261, Calif. Acad. Sci. This species occurs in Massachusetts, Lake Superior and Iowa (*Casey*, 174). Ottawa, Canada, *Harrington*. Taken by Mr. Schwarz at Alameda, Garland and Veta Pass, Col., at 9400 feet. Europe. W. Siberia. Turkestan. Heyden, 78.

174. S. argus *Grav., ageus* Casey (Schwarz and Ulke to Blanchard).

Massachusetts. Europe. Siberia (at the mouth of the Jenisei). Heyden, 78.

175. S. alpicola *Fauv.*

North America. Europe (Switzerland, Redemont, the Pyrenees).

176. S. sibiricus *Sahlb.*

Alaska. Arctic and east Siberia. Heyden, 78.

177. Lithocharis ochracea *Grav.*

This and *obsoleta* have probably been introduced from Europe, as they live about stables. Occurs in Michigan, *Schwarz;* Massachusetts, *Blanchard.*

178. L. obsoleta *Nord.*

My native specimens of this and the preceding species are from Mr. F. Blanchard, Massachusetts. Ottawa, Canada; *Harrington, in litt.*

179. Pæderus riparius *Fab.*

The occurrence of this species in North America is not yet well established, but is quite possible, as it occurs in Arctic, west and east Siberia and Amurland. Proc. Bost. Soc. Nat. Hist. xix, 6; Heyden, 77.

180. Hypocyptus longicornis *Payk., Ziegleri* Lec.

Ziegleri was described (N. S. 30) from a specimen found at York, Pa.; Massachusetts, *Blanchard.* Europe. T. vi, 86 and 124.

181. Tachinus pallipes *Grav., frigidus* Er.

This species occurs here in Pennsylvania abundantly. "Pennsylvania to Canada, Alaska and California," *Horn*, T. vi, 101. Central and northern Europe. Col. Am. 122.

182. T. *circumcinctus* Maekl., basalis *Er.*

Occurs in Canada; Michigan, Kansas, Vancouver, Alaska, l. c. 102. Boreal Russia; Ural; eastern Siberia (the affluents of the Jenisei and Amur). Heyden, 69.

183. T. **instabilis** *Maek.*, *apterus* Maek., *arcticus* Mots.

Alaska. The islands at the mouth of the Jenisei. T. vi, 101 and 124; Heyden, 69; Col. Am. 121 with plate. Fauv. 1875; Catalogue, 38.

184. T. **elongatus** *Gyll.*

This species, according to Mannerheim, occurs in Alaska (T. vi, 102). Central and northern Europe. East Siberia; Tobolsk. Heyden, 69; Mann., 1843.

185. **Tachyporus jocosus** *Say*, *arduus* Er.

I take this as well as the two following species in early spring on the underside of stones in fields. It is generally distributed throughout the central and northern portions of the Atlantic region, extending to Colorado and New Mexico. Europe (Finland). W. Siberia. T. vi, 104; Heyden, 69.

186. T. **chrysomelinus** *Linn.*, *acaudus* Say, *maculicollis* Lec.

This species has the same general distribution in America as *jocosus*. Europe throughout. Various places in Arctic, west and east Siberia. Turkestan and Bokara. T. vi, 104; Heyden, 69.

187. T. **brunneus** *Fab.*, **nitidulus** *Fab.*

Probably cosmopolitan. Occurs over our entire country, including California; also common in Europe and northern Africa. T. vi, 105. Veta Pass, Col., at 9400 feet, *Schwarz*. Various places in the basin of the Jenisei in eastern Siberia. Heyden, 70.

188. T. **scitulus** *Er.*, **macropterus** *Steph.*

Cincinnati, Ohio, *Dury;* Louisiana, one specimen, *Horn*. Common in Europe. Along the Jenisei; Amurland; Turkestan. T. vi, 105; Heyden, 70.

189. **Cilea silphoides** *Linn.*

This pretty little species occurs in Massachusetts, New York, Michigan, the Lake Superior region and various places in the Northern States. Europe generally. T. vi, 106.

190. **Conosoma littoreum** *Linn.*

Occurs at Cincinnati, Ohio, *Dury;* upper and lower Michigan, *Schwarz;* Massachusetts and Canada, *Horn*. Nova Scotia, *Harrington, in litt.* Europe. Along the Jenisei in west Siberia. T. vi, 109. Heyden, 70.

191. C. pubescens *Payk.*

Michigan and Florida, *Schwarz;* Massachusetts, *Blanchard;* New York to Louisiana, *Horn.* I take this species in fungus and about the base of dead trees. Europe. W. Siberia (places on the Jenisei). T. vi, 111. Heyden, 70.

192. Bolitobius cingulatus *Mann.*

This, as well as all our species, lives on and in living fungi. Occurs in Pennsylvania, Massachusetts, Michigan, Canada, Oregon, British Columbia, Alaska. Europe. T. vi, 116. The thorax in this species varies from black to rufous.

193. B. pygmæus *Fab.*, *3-maculatus* Say, *venustus, binotatus* Mels., *angularis* Sachse, var. *biguttatus* Steph.

I take this species and the following abundantly. It occurs from Florida to Canada; Michigan; Veta Pass, Colorado, at 9200 feet, *Schwarz;* British Columbia. Europe. East and west Siberia. T. vi, 117. Heyden, 70.

194. B. 3-notatus *Er.*, *? pœcilus* Mann.

I take this species here, in Ohio, West Virginia and New Jersey. It extends from the District of Columbia westward to the Mississippi, and northward to Canada and Lake Superior; Vancouver; Alaska. Europe. T. vi, 118.

195. Mycetoporus splendidus *Grav.*, *americanus* ‡ Horn, *inquisitus* Casey.

This species occurs in Pennsylvania, Michigan, the White Mountains, N. H., *Blanchard;* Canada; Lake Superior, Veta Pass, Col., at 9200 feet, *Schwarz;* British Columbia, *Crotch.* Europe. Arctic, east and west Siberia. T. vi, 122; Heyden, 70.

196. Olisthærus megacephalus *Zett.*, *laticeps* Lec.

Occurs in Canada; the Lake Superior region (*LeConte, Schwarz*); Alaska, Kenai (*Mann.*, 1853); Sweden; Hungary; Arctic and eastern Siberia. C. 101; L. S. 219 and 239; Heyden, 84; Fauv., 24.

197. O. substriatus *Gyll.*, *nitidus* Lec.

Found at Eagle Harbor, Lake Superior, *LeConte;* the islands, Michipicoton and Isle Royal, L. S. *Schwarz;* Massachusetts, *Blanchard.* Sweden. Germany. France. Arctic and east Siberia; *omnia*, l. c.

198. Pseudopsis sulcata *Newm.*

The species known in our literature as *P. sulcata*, and found abundantly in Canada, Michigan and the shores and islands of Lake

Superior; is said by M. A. Fauvel to slightly differ from the European species, and he has described it under the name *columbica*. Fauv., 26.

199. **Oxytelus sculptus** *Grav., mœrens* Mels

This species occurs here abundantly; according to Dr. LeConte its distribution is the Southern, Middle and Western States and Vancouver, B. C., Massachusetts, *Blanchard, in litt.* Europe. Siberia. T. vi, 235; Heyden, 80.

200. **O. rugosus** *Fab., basalis* Mels., *rugulosis* ‡ Harris.

This species is likewise found here in Pennsylvania, also in Massachusetts and Canada; Nova Scotia, *Harrington, in litt.* Europe. Arctic and middle Siberia. T. vi, 235; Heyden, 80. Amurland, Heyden, 1885.

201. **O. nitidulus** *Grav., ? rugulosus* Say.

Massachusetts, *Blanchard, in litt.;* Southern, Middle and Western States, *LeConte;* Garland and Veta Pass, Col., at 9400 feet, *Schwarz.* Europe. Various places in Arctic, west and east Siberia to Turkestan. T. vi, 237; Heyden, 80.

202 **O. depressus** *Grav.*

Dr. LeConte found one pair of this common European species in Indiana; its further occurrence has not been observed. T. vi, 237.

203. **Trogophlœus memnonius** *Er.*

This species is very abundant here in the mud on the margins of swamps and ponds. Massachusetts, *Blanchard;* Texas, *Belfrage;* Florida and Veta Pass, Col., *Schwarz.* Europe. Egypt. T. vi, 247.

204. **T. corticinus** *Grav., fulvipennis* Fauv.

Texas, *Belfrage;* Garland and Veta Pass at 9200 feet, *Schwarz.* Europe. Various places in west Siberia. Heyden, 81.

205. **T. subtilis** *Er*

This Europern species, according to Dr. LeConte, occurred in the Western and Southern States. T. vi, 246.

206. **Coprophilus striatulus** *Fab.*

Several specimens of this European species were taken in Canada by Mr. Pettit, and placed in Dr. LeConte's collection (T. v, 170). "In sculpture this species resembles *Oxytelus rugosus*, but is .25 inch. long, with the mouth parts, antennæ, the tip of the abdomen and feet brownish." Fauvel, 93.

207. **Porrhodites fenestralis** *Zett., brevicollis* Maek.

Found in Alaska, Sitkha, Kenai, *Macklin;* British Columbia, *LeConte;* Michipicoton River, Lake Superior, *Schwarz.* Lapland. Germany. Fauvel, 60. Siberia (at the mouth of the Jenisei and some of its eastern tributaries. Heyden, 82.

208. **Geodromicus nigrita** *Mull., verticalis* Say.

One of the varieties of *plagiatus* Er. It is common here along rocky streams, inhabiting between the layers of stone or shale. It occurs from Georgia to Canada; Mount Washington, N. H.; Lake Superior; Kansas, *Snow.* In Europe *plagiatus* has been divided into near a dozen named varieties; var. *nigrita* also occurs in Arctic Siberia. Heyden, 81; Fauvel, 90.

209. **Acidota crenata** *Fab., seriata* Lec.

This species is abundant on the shores and islands of Lake Superior (*LeConte, Schwarz*), Michigan, Canada; Massachusetts, *Blanchard.* Central and northern Europe. Siberia (at the mouth and in the valley of the Jenisei). Heyden, 82; Fauvel, 64; N. S. 55.

210. **A. quadrata** *Zett., patruelis* Lec., *Frankenhauseri* Maek.

Alaska, rare, *Maekl.;* north shore of Lake Superior, *LeConte;* Michipicoton River, *Schwarz.* Lapland. Boreal Asiatic Ural. N. S. 56; Heyden, 82; Fauvel, 65.

211. **Arpedium tenue** *Lec.*

"Marquette, Mich., *Schwarz;* Lake Superior; British Columbia, *LeConte;* Lapland and Asiatic Siberia, *Fauvel* An alate species. Fauvel, 63; N. S. 55.

Var. brunnescens *I. Sahlb., Gyllenhali* Zett. Found at the Michipicoton River, Lake Superior, *Schwarz.* Lapland. The mouth of the Jenisei and several places in Arctic Siberia. Heyden, 82; Fauv., 63. The variety is apterous, and is considered by Fauvel a mere variation of *tenue* not worthy of racial distinction.

212. **Amphichroum canaliculatum** *Er.*

According to Fauvel this European species occurs in California, Fauvel, 76, but in more recent letters to Dr. Horn admits the California specimens to be a distinct species = A. maculatum *Lec.*

213. **Orochares angustata** *Er.*

One specimen was taken by Mr. F. Blanchard near Lowell, Mass., found in winter in ice on an inundated meadow. Germany. France.

214. **Olophrum rotundicolle** *Sahlb., convexicolle* Lec.

Found at Eagle Harbor, Lake Superior, and Michipicoton Island and River (*LeConte, Schwarz*). Germany. Finland. Lapland. Described and figured by LeConte, L. S. 221; Fauvel, 79.

215. **Pycnoglypta lurida** *Gyll.*

The American distribution of this species according to Fauvel is "British Columbia, *Crotch;* Lake Superior, Michipicoton River, Bachewauung Bay, *Schwarz;* Massachusetts, *LeConte;* New Jersey, *Schmeltz;*" Cincinnati, Ohio, *Dury.* Europe (Germany northward to Lapland). Siberia (about the mouth of the Jenisei). Fauvel, 41; Heyden, 84.

216. **Homalium strigipenne** *Maek.*

"Alaska, Sitkha, Kadjak, *Maek.;* San Diego and Mariposa, Cal., *Thevenet.*" Amurland, Fauvel, 46; Heyden, 83.

217. **H. lapponicum** *Zett., planipenne* Maek. (*Argus* Lec. C. 103)

"Alaska, Sitkha, Kenai, *Maek.;* Colorado, Michigan at Marquette, and Gargantau, *Schwarz;* Massachusetts, *Blanchard;* Lake Superior, *LeConte;*" Ottawa, Canada, *Harrington, in litt.* Central and northern Europe. West Siberia on the Jenisei and Irtysch. Fauvel, 50; Heyden, 83.

218. **H. pusillum** *Grav., læsicolle* Maek.

This species has occurred at various places. "Sitkha, *Maek.;* California, *Crotch;* Trenton Falls, N. Y., *Schwarz;*" Veta Pass, Col., at 9400 feet, *Schwarz.* Europe. Fauvel, 51.

219. **H. foraminosum** *Maek., laticolle* Kraatz, *clavicorne* Mots.; *? lagopinum* I. Sahlb.

Sitkha, *Maek.;* taken by Mr. Schwarz at the Michipicoton River and at Detroit, Mich.; also Veta Pass, Col., at 9200 feet. Central and northern Europe. On the Angara River and around Lake Baical, east Siberia. Fauvel, 53; Heyden, 82.

220. **H. rufipes** *Fourc., florale* Er.

Found at the Michipicoton River and Detroit, Mich., *Schwarz:* Ottawa, Canada, *Harrington, in litt.;* Pennsylvania, *Ziegler.* Europe. Lake Baical, east Siberia. Fauvel, 47; Heyden, 83.

221. **H. rivulare** *Payk.*

This European species occurs, according to Fauvel, in California. Fauvel, 55.

222. **Anthobium sorbi** *Gyll.*

Occurs in Greenland. Central and northern Europe. Fauvel, 39.

223. **Protinus limbatus** *Maek.*, var. *Maeklini* Fauv.

Found at Sitkha. Europe (France and the Pyrenees). Fauvel, 30.

224. **P. atomarius** *Er., parvulus* Lec.

Ottawa, Canada; *Harrington, in litt.* Detroit, Mich. (*Schwarz*); Massachusetts, *Blanchard;* Lake Superior, Michipicoten River, Bachewauung Bay (*LeConte, Schwarz*). Europe. Sweden. Fauvel, 32. Length .05 inch.

225. **Megarthrus sinuatocollis** *Lac., angulicollis* Maek.

Occurs in Sitkha. Mr. Schwarz took it at Grafton, West Virginia and Veta Pass, Col., at 9200–11,000 feet altitude. Europe. Boreal and central Siberia. Fauvel, 28; Heyden, 84.

226. **Micropeplus tesserula** *Curt., costatus* Lec., *costipennis* Maek., *baicalicus* Mots.

Alaska, California, Lake Superior, Michigan, Canada. Europe. Algeria. Syria. Lake Baical, east Siberia; Lebedevo, Arctic Siberia. Fauvel, 7; Heyden, 91.

TRICHOPTERYGIDÆ.

The following distribution of these minute Coleoptera is translated from that wonderful monument to unwearied patience and unexampled skill —Rev. A. Matthews, Monograph of the Trichopterygidæ— and his subsequent synopsis, published in T. xi, 113, et seq., to which is added all that has been observed in American literature.

227. **Ptenidium evanescens** *Marsh. terminale* Hald.

"Habitat: Europe. America. The Canary Islands and Madeira." Pennsylvania *Hald.*, Fort Garland, Col. and Detroit, Mich., *Schwarz*. Ottawa, Canada, *Harrington.* Mon., 80; T. ii, 150; J. Ac. i, 109. "A common and abundant species."

228. **P. atomaroides** *Mots.*

"Habitat: The Atlantides, North America and Europe, teste Motschulsky; not rare." Mon. 81. This species for some reason has been omitted in the Synopsis. Mr. Schwarz found it common in a salt marsh on the eastern coast of Florida.

229. Trichopteryx ambigua *Matth.*

"Habitat: Rare in Europe, taken twice in England by Mr. Matthews. New York, taken frequently by Dr. Schaum." Mon., 119; T. xi, 139.

230. T. sericans *Heer.*

"Habitat: Europe. North America (the United States), the Canaries; found usually in refuse and the rejectamenta of stables." Mon. 130; T. xi, 137. The Kirghis Steppes. Heyden, 87.

231. T. fascicularis *Herbst.*

"Habitat: Europe and North America (United States), in ant nests and the rejectamenta of stables, but rarely, or never, in decaying vegetation." Mon. 134; T. xi, 135.

232. T. atomaria *DeG.*

"Habitat: Europe quite commonly." Mon. 142. The United States, T. xi, 131. Asia (Dauria), Heyden, 88.

233. Smicrus filicornis *Fairm.*

"Habitat: rare in Europe; quite common in North and South America in dung, and under rubbish on the river shores." Mon. 112; T. xi, 140. Detroit, Mich., *Schwarz.*

PHALACRIDÆ.

234. Olibrus bicolor *Gyll.*

Occurs in the "Middle States, not common, perhaps imported." P. viii, 16. New York, *Reinecke;* Cedar Keys, Tampa and Enterprise, Florida, *Schwarz.* Europe. Barnaul, west Siberia; Angora River, east Siberia; Turkestan. Heyden, 91.

COCCINELLIDÆ.

235. Anisosticta s'igata *Thunb., bitriangularis* Say, *multiguttata* Rand.

This species is widely distributed. Massachusetts, Canada, Michigan, Illinois, Wisconsin, Hudson Bay, Vancouver Island. France Hungary. Lapland. Irkutsk. T. iv, 369; Crotch, 93.

236. Adonia constellata *Laich., mutabilis* Scriba.

Nova Scotia *LeConte.* Common throughout Siberia. Col. Am., 245. Europe. North Africa. Madeira. Abyssinia. Central Asia. India. T. iv, 368, Crotch, 98. But one specimen has been found in our territory and this doubtful.

237. Hippodamia parenthesis Say.

This species, which occurs nearly everywhere in the United States and Canada to Alaska from Crotch's statement, is perhaps a variety of *H. amœna* Feld., the only difference being in the diminished amount of black in the design of the elytra. *H. amœna* inhabits eastern Siberia. T. iv, 368; Crotch, 97; Heyden, 215; Col. Am. 245.

238. H. 13-punctata *Linn.*

This species also occurs here with the preceding, and is equally widely distributed, extending from Hudson Bay to Alaska, and southward to the West Indies and Mexico. It appears on nearly every faunal list. It is spread throughout Europe. In Siberia it is found on the northern tributaries of the Amur and along the Jenisei and Lena. T. iv, 368; Crotch, 94; Col. Am. 244; Heyden, 215.

239. Coccinella 3-fasciata *Linn.*, var. *juliana* Muls., *barda* Lec., var. *Eugenii* Muls., var. *subversa* Lec.

This species is very variable in color ornamentation, and is widely distributed. New York, Canada, Michigan, Lake Superior, Hudson Bay, New Mexico, Colorado, California, Oregon, Alaska. Lapland to Siberia, reaching Kamtschatka. T. iv, 370; Crotch, 115; Col. Am. 245; Heyden, 217.

240. C. transversoguttata *Fald.*, 5-*notata* Kirby, var. *californica* Mem., var. *transversalis* || Muls. (*nugatoria* Muls.)

This is likewise a variable and widely distributed species. Greenland, Hudson Bay, Canada. Green Mountains, Vt.; Mount Washington, N. H.; Michigan, Lake Superior, Kansas, Colorado, Utah, New Mexico, California to Alaska. Lapland. Eastern Siberia (Angara River, Ourga, Amurland); Dauria. T. iv, 370; Crotch, 116; Col. Am. 245; Heyden, 217. Can. Ent. viii, 192.

241. C. monticola *Muls.*, *lacustris* Lec., *? nivicola* Men.

This species occurs in Canada, Michigan, Lake Superior, Kansas, New Mexico, the mountains to Colorado, Oregon, Vancouver Island. *Nivicola*, thought by Crotch to be identical, occurs in Kamtschatka, Lake Baical, Amurland, Iakutsk on the Lena, and in Arctic Siberia. T. iv, 371; Crotch, 115; Col. Am. 245; Heyden, 216.

242. C. tricuspis *Kirby*, var. *Mannerheimi* Muls.

"Hudson Bay, Canada, Lake Superior, Kansas, Siberia (Crotch, 115)." Iakutsk, on the Lena, Irkutsk, Baical, Amurland. T. iv, 371; Heyden, 216.

Obs.—The name tricuspis used by Thunberg in his enumeration of the Coccinellidæ of Sweden, being unaccompanied by an adequate description, the name Kirbyi proposed as a substitute is unnecessary. Ins. Suecia, P. viii, 1794.

243. C. menetriesi *Muls.*

A variety of 11-*punctata* Linn., a species that is spread over Europe, North Africa, Syria and Siberia, is said to occur in northern California by Mulsant; Mr. Crotch thinks this extremely doubtful. T. iv, 364; Crotch, 114; Col. Am. 245; Heyden, 216.

244. Adalia frigida *Schon.*, *hyperborea* Payk., *melanopleura* Lec., *ophthalmica* Muls., *barda* Lec.

This species is very variable. It extends across the northern part of the continent from Hudson Bay to Vancouver Island south to California and New Mexico through the Rocky Mountains; Kansas, Missouri, New York, Canada. Lapland. Siberia. Dauria. T. iv, 372; Crotch, 100; Heyden, 216; Nord., 30; Heyden, 1885.

245. A. bipunctata *Linn.*, var. *humeralis* || Say, *bioculata* Say, var. 6 *pustulata* Linn.

This species is widely distributed, occurring in nearly all the States from the Atlantic to the Pacific, Vancouver Island, Canada and Nova Scotia. It is found throughout the greater part of Europe and Siberia. T iv, 372; Crotch, 102; Col. Am. 245; Heyden, 216; Nord., 30.

246. Harmonia (*Calvia*) 14-guttata *Linn.*, *similis* Rand., *cardisce* Rand., var. *hesperica* Cr.

Similis occurs on Mount Washington, N. H.; *hesperica* in Arizona. "New England States, *Crotch;* Marquette, Mich., *Schwarz.* Europe generally. West and east Siberia. Var. *similis* is found in Siberia, 'where forms occur in which black replaces the normal red color.'" T. iv, 373; Nord., 30; Heyden, 217.

247. H. 12-maculata *Gehl.*, *incarnata* Kirby.

Hudson Bay. Marquette, Mich.; Lake Superior; Mount Washington, N. H. Kamtschatka. Lake Baical. Dauria. T. iv, 374; Crotch, 110; Heyden, 216.

ENDOMYCHIDÆ.

248. Mycetæa hirta *Marsh.*

This European species has occurred at various places; Baltimore and New York, *Crotch;* Detroit, Mich., *Schwarz;* Buffalo, N. Y., *Reinecke;* my native specimens are from Massachusetts, *Blanchard.* T. iv, 362.

COLYDIIDÆ.

249. **Aglenus brunneus** *Gyll.*, *Anommatus obsoletus* Spence.

This species is figured Brit. Coleop. Delin. by Spry & Shuck, pl. 33, fig. 2. It is probably introduced. My native specimens are from Missouri (*Schuster*); it has also occurred in California (C. 127). Lieut. Casey took a colony of about forty individuals near San Francisco, Cala., under a board long imbeded in a thick grassy turf, Pr. Ent. Soc. Wash. i, 46. In Europe it occurs about houses. Samarkand in Turkestan. Heyden, 94.

250. **Murmidius ovalis** *Beck.*

Probably introduced from Europe. This minute insect, only .05 inch. long, has been observed several times in this country; it seems to live in mouldy straw. Pr. 1876, 270. My native specimens are from Washington, D. C.

RHYSODIDÆ.

251. **Rhysodes exaratus** *Serv.*, *americanus* Lap., *aratus* Newm.

This species extends from New York and Michigan southward to Georgia and westward to Missouri and Iowa, though it is not common. I have met it here only once. France. Germany. Austria. Russia. T. v, 162.

CUCUJIDÆ.

252. **Silvanus surinamensis** *Linn.*, var. *bicornis* Er., 6-*dentatus* Fab.
253. **S. bidentatus** *Fab.*
254. **S. cassiæ** *Reiche*, *quadricollis* || Lec.
255. **S. advena** *Watl.*, *musaeorum* Zieg.
256. **Nansibius dentatus** *Marsh.*, *major* Zimm.

These five species are cosmopolitan. *S. cassiæ* occurs from New York to the Southern States, where it is especially abundant. *S. bidentatus*, *advena* and *N. dentatus* are generally distributed, being often taken under bark as well as in articles of commerce. Lieut. Casey has outlined these species, T. xi, plate 4; P. vii, 77. *Surinamensis* occurs in Turkestan and western Siberia; *bidentatus* in east Siberia. Heyden, 95.

257. **Prostomis mandibularis** *Fab.*, *americanus* Crotch.

Taken by Mr. Crotch on Vancouver Island; "Oregon, California, Nevada," *Casey*. Europe. T. v, 74; T. xi, 76.

258. Pediacus fuscus *Er.*, *planus* Lec., *subcarinatus* Mann.

This species occurs in Canada, Michigan, Lake Superior, Hudson Bay (*LeConte Cat.*), Nebraska, Colorado, New Mexico, Alaska. Central Europe; Italy. P. vii, 73; T. xi, 79. Amurland (Chabarofka). Heyden, 1886.

259. P. depressus *Hbst.*, var. *subglaber* Lec.

North Carolina *LeConte;* Michigan, Lake Superior, Veta Pass, Col., at 9200 feet, *Schwarz;* I took three specimens here under the bark of a standing tree, and have one from Rev. G. W. Taylor from Vancouver Island, all agreeing with the description of *subglaber*. P. vii, 73; T. xi, 79. Central and northern Europe.

260. Læmophlæus testaceus *Fab.*, *Zimmermanni* Lec., *bullatus* Lec.

This species is very common here, being mostly found under the epiderm of bark, and occurs in nearly every place where there are deciduous trees from the Atlantic to the Pacific. It is likewise general in Europe. P. vii, 75. Amurland (Chabarofka). Heyden, 1886.

261. L. alternans *Er.*

South Carolina (*Zimm.*). T. ii, 257. Europe.

262. L. ferrugineus *Steph.*, *testaceus* Payk.

This and the preceding are said to be cosmopolitan. No record of their having been taken in America has been observed, except that the latter occurred in beans from Brazil, living on the débris of a Bruchus, in the Centennial Building, Philadelphia, and in mouldy straw goods from Italy, in New York. Pr. 1876, 270; T. xi, 92.

263. L. pusillus *Sch.*, *puberulus* Lec., *longicornis* Mann.

This species likewise accompanies commerce, but there are few records of its occurrence in North America. Dr. LeConte described it from the Colorado River and Mannerheim from Sitkha. My specimens are from Massachusetts (*Blanchard*). P. vii, 75; T. xi, 94. South Carolina, *Zimm.* T. ii, 257.

264. Dendrophagus glaber *Lec.*, *cygnæi* Mann., var. *americanus* Mann., var. *germari* Mann.

This form, Mr. Casey states, is probably a variety of *crenatus* Payk., a species of central and northern Europe. T. xi, 98. It is not seemingly abundant, but is distributed from New York and Canada northward and westward to Vancouver Island and Sitkha, and through the Rocky Mountains to New Mexico, whence I have specimens.

265. Psammœcus Desjardinsii *Guer.*, *Pseudophanus signatus* Lec., *Crytamorpha musæ* Woll., *Hubbardii* Casey.

This species is said to be cosmopolitan, accompanying commerce (Mauritius, Madagascar, St. Helena, Madeira). In the United States it is described from Puget's Sound, Washington, by LeConte. P. vii, 85; and was taken abundantly at Crescent City, Fla., by Mr. Hubbard. Casey, Cont. 167; C. 135; Mann. 1853.

CRYPTOPHAGIDÆ.

266. Henoticus serratus *Gyll.*, *denticulata* Lec.

This species occurs from Canada to Alaska. It is not uncommon here in Pennsylvania; Massachusetts and New Hampshire, *Blanchard;* Canada, Michigan, around Lake Superior, Veta Pass, Col., at 10,000 feet, *Schwarz*. L. S. 223. Europe. Amurland (Chabarofka). Heyden, 1886; Mann., 1853.

267. Cryptophagus cellaris *Scop.*

This species has been imported from Europe, where it is found in houses, etc. In this country there are few records of its recognition. Buffalo, N. Y., *Reinecke;* Detroit, Mich., *Schwarz;* San Diego, Calif., *LeConte*. Taschkend in Turkestan. Heyden, 96.

268. C. saginatus *Sturm.*

Also imported from Europe, and identified by Zimmermann in S. Carolina *Horn*. Jeniseisk on the Jenisei, lat. 58° 20′. Nord., 26.

269. Cænoscelis ferruginea *Sahlb.*, *testacea* Zimm.

This is likewise a common European species, which was taken in South Carolina by Zimmermann, and also occurred in Alaska. T. ii, 258. Chabarofka. Heyden, 1885; Mann., 1853.

270. Atomaria Kamtschatica *Mots.*

Occurred in Alaska. Kamtschatka. Heyden, 96; Mann., 1853.

The Cryptophagidæ have not yet received any attention in this country from systematists. The species are greatly neglected by collectors on that account, and are mostly undescribed.

MYCETOPHAGIDÆ.

271. Typhæa fumata *Linn.*, *Cryptophagus gilvellus* Muls., *crenatus* || Mels. (P. ii, 114; P. viii, 15)

Cosmopolite through commerce. Occurs wherever flour, grain, etc., are stored.

272. **Hypocoprus formicetorum** *Mots.*

Taken at Garland, Colorado, in ant's nest (*Schwarz*), and thought by the authors of the Classification to be identical with Motschulsky's species, which occurs in the Kirghis Steppes. C., 140; Heyden, 95.

DERMESTIDÆ.

273 **Dermestes carnivorus** *Fab.*, *mucoreus* Lec.

This species, native in the basin of the Mediterranean, occurs in Texas. P. Am. P. xx, 352.

274. **D. lardarius** *Linn.*, var. *signatus* Lec., var. *vorax* Mots.

This species varies locally in the color and extent of the pubescence. It is nearly cosmopolitan; it is probably native, as well as introduced by commerce. It occurs everywhere from the Atlantic to the Pacific. Eastern and western Siberia, in the basin of Lake Baical; Amurland; Dauria. Var. *vorax* has the basal fascia of the elytra bright, to yellow rufous. T. v, 50; P. vii, 109; P. Am. P. xx, 353; Col. Am. 123 and plate; Heyden, 98.

275. **D. elongatus** *Lec.*

Should comparison prove this to be the European *bicolor* Fab. as Mr. Jayne thinks probable (P. Am. P. l. c.), its introduction from Europe is quite likely. Though not commonly met with, its distribution is extensive; New York, Canada, Kansas, Texas, Georgia, Florida, whence I have a specimen. P. vii, 109.

276. **D. cadaverinus** *Fab.*, var. *domesticus* Germ., var. *subsulcatus* Ball.

Mr. Schwarz took this European species in southern Florida, and I have a specimen from St. Augustine, Fla. Its occurrence in Alaska is probable, as it occurs in Turkestan; Dauria; Amurland; west and east Siberia to Kamtschatka. Col. Am. 124; Heyden, 98.

277. **D. vulpinus** *Fab.*, *lupinus* Mann., *maculatus* DeG.

This species admits of some variety, chiefly in pubescence; it appears to be cosmopolitan. In this country it is generally distributed from Florida to Alaska; likewise in Europe. It occurs in Arctic, east and west Siberia, and countries to the south. P. vii, 109. Heyden, 98.

278. **D. Frischii** *Kug.*

This species has likewise been introduced from Europe. It occurs abundantly on Brigantine Beach, N. J., and has been taken by Mr. Ulke at Washington, D. C. (*Ulke, in litt.*). Can. Ent. xvi, 37. Amurland and adjoining countries in the orient. Heyden, 98.

Obs.—D. murinus *Lin.* frequently appears in our literature, perhaps from a wrong determination of certain forms of *caninus* Germ. with brown antennæ and a minimum of fulvous mottling.

279. Attagenus piceus *Oliv.*, *megatoma*, Fab. *dichrous*, *rufipennis*, *spurcus*, Lec.

The synonymy indicates local variableness. It is found abundantly in houses and granaries, also frequenting flowers. It occurs nearly everywhere from the Atlantic to the Pacific, and also is general in Europe, whence it has undoubtedly been imported. P. vii, 109; P. Am. P. xx, 355; Lintner's second Annual Report, New York, p. 46, gives its œconomic history.

280. A. pellio *Linn.*, *bipunctatus* DeG.

This species, introduced from Europe, is much rarer, living mostly on desicated animal substances; it is occasional in museums. It has occurred in Nova Scotia, Canada, Michigan, New York and various places in the eastern States. P. vii, 109; P. Am. P. xx, 356.

281. Anthrenus scrophulariæ *Linn.*, var. *thoracicus* Mels., var. *flavipes*, var. *lepidus* Lec

The varieties denote color ornamentation rather than differences of structure. The larvæ of this beetle are sometimes very destructive to carpets, and occasionally infest museums of natural history. It occurs in many places from the Atlantic to the Pacific, but not everywhere. Europe. P. vii, 112; P. Am. P. xx, 369; Amer. Nat. xii, 536.

282. A. *varius* Fab., verbasci *Linn.*, *tricolor* Herbst, var. *destructor* Mels.

This insect is in bad repute with all who make zoological collections. It appears to be cosmopolite. P. vii, 112; P. Am. P. xx, 370; Can. Ent. xv, 82 and 90. Heyden, 99.

283. A. museorum *Linn.*, *castaneæ* Mels., *verbasci* Fab.

This species is very abundant from early spring to June on various flowers, especially *spiraca*, *cornus* and *castanea*. It is not known here to have any bad habits like the foreign species. It occurs in Canada, and in nearly all the States eastward from the Mississippi. Europe. The southern parts of east and west Siberia. P. vii, 112; P. Am. P. xx, 370; Can. Ent. xv, 90. Heyden, 99.

284. A. *claviger* Er., fuscus *Latr.*

This European species occurs in Pennsylvania, though I have not met with it. T. v, 252; P. Am. P. xx, 371.

285. **Orphilus glabratus** *Fab., ater* Erich, *subnitidus* Lec.

This species occurs in spring on various flowers, and extends from ocean to ocean. Europe. Taschkend in Turkestan. P. vii, 113; P. Am. P. 373. Heyden, 99.

HISTERIDÆ.

286. **Hister merdarius** *Hoffm., memnonius* Say.

This species, which inhabits central and southern Europe, and likewise eastern Siberia, occurs in various places in the Middle and Southern States, but not abundantly. Southwest Virginia, New York, Ottawa, Canada; *Harrington, in litt.;* Michigan, Escanaba and Marquette, Mich., *Schwarz.* I take it here in Pennsylvania, also in eastern Ohio and West Virginia. P. Am. P. xiii, 284. Heyden, 89.

287 **H. bimaculatus** *Linn., obliquus* Say.

This species is general in Europe, extending to the Kirghis Steppes, Turkestan, and the adjacent parts of Siberia. It occurs here in the Middle States, *Horn;* Detroit, Mich., *Schwarz.* I take a specimen occasionally here in Pennsylvania, and have specimens from Iowa and northern Illinois, loc. cit. 292. Heyden, 89.

288. **Paromalus 14-striatus** *Steph., nana* Lec.

This species is somewhat cosmopolitan. Middle States to Georgia (*Horn*, l. c. 308). I once saw several hundred specimens in a desiccated carcass on Brigantine Beach, N. J., and also took a colony here in some half dried fungus, and have specimens from St. Augustine, Fla.

289. **Saprinus rotundatus** *Kugel, deletus* Lec.

"Occurs in the entire Atlantic region and also in California; var. *communis* Mars. is a form found in Canada, and var. *interceptus* Lec. in California and Oregon." (*Horn*, l. c. 314) Europe. The southern parts of east and west Siberia and Turkestan. Heyden, 90.

NITIDULIDÆ.

290. **Brachypterus urticæ** *Fab., Cercus pusillus* Mels.

This species is found on the flowers of *Urtica dioica*, with which it has probably been introduced from Europe. "Occurs in the Atlantic States," Horn, T. vii, 270. New York, Canada, Michigan, Kansas, Colorado; abundant here in Pennsylvania. Krasnojarsk, on the Jenisei, lat. 56°; Nord. 25.

291. **Cercus bipustulatus** *Payk.*

A few individuals of this European species were once taken near Boston, Mass., *Horn*, but any further record of occurrence has not been observed; var. *suturalis* Mots. is found in eastern Siberia; T. vii, 272; Murr., 233.

292. **Carpophilus hemipterus** *Linn.*, *bimaculatus* Mels., *flexuosus* Payk.

Variable both in ornamentation and thoracic structure, cosmopolitan. Florida, Canada, Alaska, are the extreme points of its occurrence. I take it here mostly in boxes of dried fruit, as raisins, currents, etc., brought from foreign countries. It also occurs in Siberia, l. c. 277; Murr., 362; Heyden, 91.

293. **C. dimidiatus** *Fab.*, *mutilatus* Er., *luridus* Murr.

"Occurs everywhere in our country excepting the Pacific coast. Its original habitat was probably the West Indies, but it is now cosmopolitan," Horn, l. c. 278; Murr., 377–79; some of the points of its occurrence are Florida, here in Pennsylvania, Ohio, Texas, New Mexico, Colorado, Alaska. Mann., 1852.

294. **Epuræa æstiva** *Linn.*, *convexiuscula* Mann.

On this continent this species appears to affect the colder parts. Canada, northern Michigan, New Mexico, Alaska, are all points in its distribution. Mr. F. Blanchard found it in the mountains of North Carolina (*in litt.*) loc. cit. 299. Europe. Western Siberia. Heyden, 92.

295. **E. luteola** *Er.*, *texana* Crotch.

Dr. Horn states that this species is becoming cosmopolitan. "Originally occurring in our Gulf States and Cuba, it has spread to Europe (*Reiche*) and Ceylon (*Murray*)," l. c. 301.

Obs.—Several species of *Epuræa* of the boreal and Arctic regions, when those of both continents shall have been collected by some competent entomologist, will probably be found identical.

296. **Nitidula bipustulata** *Linn.*

This beetle occurs in many countries, and has been introduced here by commerce. It now extends from Florida to Canada and westward to Colorado, whence I have specimens. West and east Siberia; Amurland, l. c. 302. Heyden, 92; Heyden, 1886.

297. **N. rufipes** *Linn.*, *obscura* Fab., *ossium* Kirby.

This species has likewise been introduced from Europe, and has about the same American distribution, extending northward to Hudson Bay. West and east Siberia, l. c. 303; Heyden, 92; Amur Territories; Heyden, 1885.

298. Omosita colon *Linn.*

This is another introduced European species, and, like the two preceding, occurs here, though greatly more commonly and abundantly. It has spread from the Atlantic to Colorado, where it meets *O. discoidea* in its eastern progress. The southern contiguous parts of west and east Siberia; Amurland, l. c. 306; Heyden, 92.

299. O. discoidea *Fab., inversa* Lec.

"Occurs in Europe and in the Pacific States, extending as far east as Colorado," Horn, l. c. 306. Northern Michigan, *Schwarz;* Ottawa, Canada, *Harrington, in litt.* It appears to be very abundant in New Mexico and Colorado.

300. Meligethes brassicæ *Scop., æneus* Fab., *rufimanus* Lec., *mœrens* Lec., *californicus* Reitter.

"This species occurs in California and Oregon," Horn, l. c. 313. The var. *dauricus* Mots. *viridipennis* Mots. occurs throughout eastern Siberia and Amurland; Col. Am. 129 and figure.

301. Cryptarcha strigata *Fab.*

While not very abundant, this species is found in many places from the Atlantic to Colorado, though a record northward from Michigan has not been noted. West Siberia, l. c. 322; Heyden, 93; Chabarofka, Heyden, 1886.

302. Ips fasciatus *Oliv., geminatus* Mels., 4-*signatus* Say, 6-*pustulatus* Reit., *bipustulatus* Mels.

These names indicate merely color variations, and several others might be given with equal propriety to other forms. I observe no structural differences of any permanency between these forms, nor the 4-*guttatus* Linn. of Europe, which has nearly the same markings as *geminatus*. This species occurs everywhere in the United States eastward from the Rocky Mountains and across the northern part of the continent to Oregon and Vancouver, l. c. 323, Can. Ent. xvii, 46.

LATRIDIIDÆ.

The species of this family being minute and difficult to recognize, are mostly neglected by collectors, many of them are undescribed, and their distribution is but faintly indicated by the records.

303. Haloparamecus singularis *Beck.*

A little thing, only 03 inch. in length, which inhabits under bark in central Europe; occurred at Fort Yuma, California. C. 156; and at New York in mouldy straw goods from Italy. Pr. 1876.

304. **Latridius minutus** *Linn., reflexus* Lec.

"New York, Lake Superior, Illinois," LeConte, vii, 304. Northern Michigan, *Schwarz*. Alaska, Mann., 1853. Very abundant here, and also in Ohio and West Virginia in early spring, under bark and about wood. It is general in Europe, and common in eastern Siberia to Kamtschatka, also in Turkestan. Col. Am. 114; Heyden, 96.

305. **L.** *parallelocollis* Mann., **consimilis** *Mann.*

Alaska, Lake Baical, eastern Siberia. Heyden, 96.

306. **L. filiformis** *Gyll.*

"A specimen of this European species was found in Missouri and another in the Acad. of Nat. Sci. at Philadelphia," LeConte, P. vii, 304. I once took here some specimens of this minute insect in the débris of a box of imported raisins.

307. **L. ruficollis** *Marsh., pulicarius* Mels.

"Middle and Southern States; sometimes abundant, flying at twilight," LeConte, l. c. 304; P. ii, 115. Europe.

308. **Coninomus carinatus** *Gyll., Latridius sculptilis* Lec.

Southern Illinois, *Haldeman;* LeConte, l. c. 303. Detroit, Mich., *Schwarz*. Europe.

309. **Corticaria pubescens** *Gyll., grossa* Lec., *piligera* Mann.

"One specimen found at the edge of a salt marsh, near Cambridge, Mass., in May," LeConte, l. c. 299; northern Michigan, *Schwarz*. Europe. Barnaul, southeastern west Siberia. Heyden, 97.

310. **C. fenestralis** *Linn., deleta* Mann., *Kirbyi* Lec., *ferruginea* Marsh, *denticulata* || Kirby.

This species occurs at widely separated places (Florida, south and north Michigan, Veta Pass, Col., at 9200 feet) *Schwarz;* Buffalo, N. Y., *Reinecke*); very abundant at Lake Superior, *LeConte;* Hudson Bay region; Alaska. Europe. Kamtschatka; common in Dauria. P. vii, 300; Col. Am. 113; Heyden, 97; Chabarofka, Heyden, 1886.

311. **C. serrata** *Payk*, *prionodera* Lec., *8-dentata* Say.

Buffalo, N. Y.; Detroit, Mich.; Nebraska; San Jose, California, are recorded as places where this species has occurred. Europe. P. vii, 300.

312. **C. elongata** *Hummel.*

Detroit, *Schwarz;* I have a specimen from Massachusetts, *Blanchard*, and have taken it here twice, beaten from herbage. Europe.

TROGOSITIDÆ.

313. **Tenebrioides mauritanica** *Linn.*, var. *nitida* Horn, var. *crassicornis* Horn.

This is a cosmopolite. It abounds here in mills and granaries, and occurs as far north as Alaska. Europe. Siberia; Turkestan. Pr. 1862, 63; Heyden, 94.

314. **Peltis** (*Ostoma*) **ferruginea** *Linn.*, *fraterna* Rand.

Mr. Randall took this species in Maine under bark. B. J. ii, 17; Green Mountains, Vermont, *Sprague;* Canada; Hudson Bay region; Lake Superior region; Colorado, California and Oregon, *Horn.* I have specimens taken in Pennsylvania. Europe. Irkutsk, east Siberia. Heyden, 94. Chabarofka, Heyden, 1886.

315. **Calitys** (*Nosodes*) **scabra** *Thunb.*, *dentata* Fab., *silphides* Newm., *Peltis serrata* Lec.

This species crosses the northern part of the continent: New York, Canada, Michigan, Lake Superior, Washington Territory. I have a specimen from Colorado. Central and northern Europe. Pr. 1859, 84.

MONOTOMIDÆ.

316. **Monotoma picipes** *Herbst.*, *foveata* Lec., *scabra* Kunze, var. *brevipenne* Kunze.

"Occurs from the Middle States to Texas and California," Horn, T. vii, 259; P. vii, 305. Massachusetts (*Blanchard*); Ohio, *Dury;* Michigan, *Schwarz.* "Probably introduced from Europe," *Horn.* Siberia and the countries southward. Heyden, 95.

317. **M. 4-foveolata** *Aube.*

"Occurs in the District of Columbia, *Ulke*," Horn, T. vii, 260. Europe.

318. **M. longicollis** *Gyll.*

"Three female specimens occurred in the District of Columbia," *Horn*, T. vii, 261. I took a single specimen here in Pennsylvania. Europe.

DERODONTIDÆ.

319. **Peltastica tuberculata** *Mann.*

A species of this genus has been described by Mr. George Lewis, from Japan, of which Dr. Horn writes: "Having compared specimens sent me by Mr. Lewis with the series in my cabinet of our species, they seem scarcely more than a variety." Oregon to Alaska.

BYRRHIDÆ.

320. **Simplocaria metallica** *Sturm.*, *Byrrhus tessellatus* Lec. (L. S. 224)

Occurs abundantly at Mount Washington, N. H. B. J. xvi, 269. The Lake Superior region; Alaska. Mann., 1853. P. vii, 116. Sweden. Hungary. Germany.

321. **Cytilus** *sericeus* Forst., **varius** *Fab*, *trivittatus* Mels.

These names seem to indicate mere differences in the color and arrangement of the pubescence. I have seen many specimens from various places in Europe and America; were the so-called species deprived of pubescence and mixed, I know of no character by which they could be separated. The individuals are abundant when found. As thus constituted the species extends northward from Pennsylvania to Hudson Bay (the Green Mountains, Vermont, Mount Washington, N. H.; Nova Scotia; Canada; Michigan; the Lake Superior region. Eastern and western Siberia. P. vii, 115; Heyden, 100; Heyden, 1886.

322. **Byrrhus murinus** *Fab.*, *undatus* Mels.

This species occurs in New York, Northern Michigan, Lake Superior, Pennsylvania, but apparently is not common. Europe. West and east Siberia. P. ii, 117; P. vii, 115; Heyden, 99.

323. **B. fasciatus** *Fab.*, var. *Kamtschaticus* Mots.

Europe. Kamtschatka, east Siberia, Amurland, Dauria. Col. Am. 123 and figure; Heyden, 100.

324. **Cyphon variabilis** *Thunb.*, *ovalis* Say, *fusciceps* Kirby, *Helodes picea, punctata, nebulosa, modesta* Lec., *pubescens* Fab.

This excessively variable species occurs here in the greatest abundance, and every place that is not too arid; "extending from the Hudson's Bay region to Florida and Texas, and in the west to Vancouver;" abundant in Alaska, Mann., 1853. Europe. On the Jenisei and Obi, Arctic Siberia. Heyden, 125; Nord., 27.

325. **C. Padi** *Linn.*, *Helodes pusilla* Lec.

"Occurs from Massachusetts to Indiana." Horn, l. c. 110; Bachewauung Bay, Michipicoton River, *Schwarz;* Ottawa, Canada, *Harrington, in litt.* Europe. On the Jenisei and Obi, Arctic Siberia. Nord., 27; Heyden, 125.

326. **C. coarctus** *Payk.*, *griseus* Gebl.

This species is said by Guerin to occur in our fauna, but is unknown, Horn, l. c. 109. Europe. Barnaul, west Siberia. Heyden, 125.

ELATERIDÆ.

327. **Cryptohypnus hyperboreus** *Gyll.*

This species, which occurs in the Alps and Lapland in Europe, and on the Obi and Jenisei in Arctic Siberia and in Kamtschatka, is found in Alaska according to Mannerheim. Heyden, 121; Nord., 26.

328. **C. pulchellus** *Linn.*, *exiguus* Rand., *guttatulus* Mels.

Dr. LeConte supposed this species might have been introduced from Europe. Massachusetts, whence my native specimens; New York; the mountains of Lycoming, Pa.; Ohio (*Dury*). T. Am. P. x, 487. West Siberia. Heyden, 121.

329. **C. littoralis** *Esch.*

Occurs in Alaska. Kamtschatka. Heyden, 121. My specimens are from Sitkha, where it is said to be common.

330. **C. bicolor** *Esch.*, *lacustris* Lec., *picescens* Lec., *fallax*, *limbatus*, *scarificatus* Mann.

Common in Labrador (*Packard*); Mount Washington, N. H., *Austin*; Lake Superior (*LeConte*, *Schwarz*); Veta Pass, Col., at 9200 feet, *Schwarz*; Alma and Leavenworth Valley, Col., at 9000–10,000 feet, *Bowditch*; Santa Fe Cañon, New Mexico, *Snow*; Alaska, *Mann.* Kamtschatka. Heyden, 121. Nikolaevsk, Heyden, 1885.

331. **Elater nigrinus** *Payk.*, *anthracinus* Lec.

The distribution of this species is wide; Alaska to Vancouver, *LeConte*; Michigan, *Schwarz*; Canada; Green Mountains, Vermont, *Sprague*. Central and northern Europe. Barnaul, on the Obi, west Siberia; Amurland. T. xii, 10; Col. Am. 111; Heyden, 120; Mann., 1853.

332. **Melanotus castanipes** *Payk.*, *obscurus* Oliv. (*scrobicollis* Lec. ♂, *castanipes* Lec. ♀, *Horn, in litt.*); *inæqualis* Lec.

This species, as thus constituted, occurs from the Middle States to Canada (Pennsylvania, Ohio, New York, Green Mountains, Vermont, Michigan, Lake Superior region). Europe. West Siberia; Amurland. T. Am. P. x, 476; Heyden, 121.

333. **Athous undulatus** *DeGeer*, *trifasciatus* Herbst., var. *bifasciatus* Gyll., var. *unifasciatus* Motsch.

"Mr. Ulke received specimens of this species from Hudson Bay, LeConte. Pr. 1866, 391; notice of its occurrence elsewhere has not been observed. Europe. Siberia (Iakutsk, on the Lena, and several places in the Government of Tomsk). Heyden, 122.

334 **Paranomus** (**Eanus**) **costalis** *Payk.*, *Limonius vagus* Lec.

The northern shore of Lake Superior, *LeConte;* Isle Royal, *Schwarz;* Mount Washington, N. H., *Austin;* Labrador, *Packard.* Europe (Sweden. Finland. Lapland). Nikolaevsk, on the Amur. T. Am. P. x, 434; Col. Am. 112; Heyden, 124.

335. **Corymbites virens** *Schranke, anchorago* Rand., *Kendalli* Kirby, *æneicollis* Oliv.

This fine species is found in the northern range of States, and northward through Canada to 65° latitude. Maine (*Randall*); Mt. Washington, N. H., *Austin;* Canada (*various collectors*); Detroit and Marquette, Mich., *Schwarz;* north side of Lake Superior, *LeConte;* I have a specimen from Manitoba. Europe (Germany. Austria. France), l. c. 444; B. J. ii, 5.

336. **C. tessellatus** *Linn.*, *viridis* Say, *cuprascens* Lec., *micans* Germ., *holosericeus* Oliv. (var. *pruinosus* Mots., Japan and the Amur)

New York and the New England States, *LeConte;* Green Mountains, Vermont, *Sprague;* Detroit, Mich., *Schwarz.* Canada. Specimens from the Italian Alps are identical with my specimens from Canada; Arctic, east and west Siberia; Turcomania; l. c. 444–45; Heyden, 123.

337. **C. sericeus** *Gebler.*

This species inhabits in the peninsula of Kenai (fide Ménétriés). Kamtschatka; Amurland; west Siberia. Mann., 1853; Heyden, 123.

338. **C.** *metallicus* Payk., **nigricornis** *Panz.*, *nitidulus* Lec.

Abundant at Lake Superior, *LeConte;* Detroit and Marquette, Mich., Garland and Veta Pass, Col., at 9400 feet, *Schwarz;* my specimens are from Massachusetts. Central and northern Europe; l. c. 438. Siberia, Heyden, 123.

339. **C. cruciatus** *Linn.*, *pulcher* Lec., *festivus* Lec.

This beautiful species, though not common, is widely distributed. Green Mountains, Vermont, *Sprague;* New Hampshire, *LeConte;* Ottawa, Canada, on beech logs, *Harrington;* Steilacoom, Washington, *LeConte;* my specimen is from Vancouver Island. Europe; l. c. 440; T. iii, 323; P. R. R. 46; Can. Ent. xvi, 71.

340. **C.** *confluens* Gebler, a variety of **rugosus** *Germ.*

Occurs in Alaska. Russia. Siberia (places in the governments of Tomsk and Iakutsk). Mann., 1853; Col. Am. 109; Heyden, 124.

341. C. (*Elater*) semivittatus *Say, tristis*, Cand.

Specimens of *tristis*, taken in Japan, on comparison, do not differ from *semivittatus*, which is believed by Dr. Horn to be the older name. Horn, x, 228; T. vii, p. xvi.

BUPRESTIDÆ.

342. Chalcophora virginiensis *Drury*, C. angulicollis *Lec.*, C. mariana *Linn.*

These names in the catalogues are specific. Numerous specimens of *virginiensis* from the eastern Atlantic States to Florida; of *angulicollis*, from the Rocky Mountains and Vancouver, and of *mariana* from Europe, have been seen and compared, with the result that there has been no character observed permanent enough to more than separate them into geographical races. The external sexual characters are apparently the same. There are as valid reasons for making species of at least two other forms which I have seen as of the above.

C. virginiensis *Drury, virginica* Say, *liberta* (var. *obscura*), Fitch, *novæboracencis* Fitch.

Middle, Eastern and Southern States. *LeConte;* var. *lacustris* Lec. (*Crotch*). Lake Superior.

C. angulicollis *Lec., oregonensis* Fitch.

Vancouver to New Mexico and California.

C. mariana *Linn., hiulca* Pallas.

Europe. West Siberia (the Obi and tributaries). T. Am. P. xi, 190; Pr. 1873, 84; Heyden, 115.

343. Mela ophila longipes *Say, immaculata* Mann.

This species is often mentioned in our literature as, and has been labeled in many of our collections, *appendiculata* Fab., which, on comparison with several specimens in hand it may prove to be (Horn, T. x, 104). It is very widely distributed. "Maine to Alaska," *Horn.* Hudson Bay; Vancouver; Rocky Mountains to New Mexico; Lake Superior. I take it here in Pennsylvania, and have it from West Virginia and Ohio. General in Europe. Arctic Siberia; Kamtschatka; Siberia generally. T. Am. P. xi, 211; Col. Am. 108; Heyden, 117.

344. M. Drummondii *Kirby.*

Dr. Horn regards this excessively variable species as merely a slight variety of guttulata Gebl. (T. x, 104), which seems also to

have been the opinion of Mannerheim, whose synonymy is *guttulata* Gebler, *discopunctata* Fald., *Drummondi* Kirby, *Gebleri* Dej. (Mann., 1853) It has the same distribution as *longipes*, except that notice of its occurrence in the Atlantic States southward from New York has not been observed. Arctic, western and eastern Siberia, and along the Amur. T. Am. P. xi, 213; Col. Am. 108; Heyden, 117; Heyden, 1885.

345. **Anthaxia salicis** *Fab.*

This brilliant little European species was taken by H. A. Brous, at Smoky Hill, Kansas, in a Malvaceous plant, as recorded by Dr. Horn, T. x, 107. Its further occurrence has not been noted.

LAMPYRIDÆ.

This family is not in great favor with collectors and systematic writers, and while the more common and conspicuous species are superficially known, a commencement of the study is about all that can be claimed. Only two species, one of them introduced, have so far been identified with European or Asiatic species; others may in time.

346. **Eros aurora** *Hbst., coccinatus* Say.

This species is not uncommon here in Pennsylvania; it extends from Georgia to the Mississippi, and northward to Canada, Lake Superior and Oregon. Europe generally. Eastern and western Siberia. T. ix, 24; Heyden, 126.

347. **Lamprohiza** (*Phausis*) **splendidula** *Linn.*

"Introduced from Europe and apparently naturalized in Maryland and Illinois," LeConte, T. ix, 36.

MALACHIDÆ.

348. **Malachius æneus** *Linn.*

This European species occurred at Cambridge, Mass., but does not seem to have spread widely. P. vi, 165; T. iv, 113. Eastern and western Siberia. Heyden, 128.

CLERIDÆ.

349. **Opilus domesticus** *Sturm.*

This species of northern and central Europe has been introduced into Canada, LeConte's List, 55. It occurred but once, and has not been found since, *Horn.*

350. **Tarsostenus univittatus** *Rossi, albofasciatus* Mels., *Tillus picipennis* White.

This is a cosmopolitan species which has occurred at a few places in North America. Pennsylvania, *Melsheimer;* Texas, *LeConte.* Pr. 1873, 334; An. Lyc. v, 17; J. A. iv, 36.

351. **Laricobius Erichsoni** *Ros., rubidus* Lec. (C. 220)

District of Columbia under the bark of a conifer, *LeConte;* Detroit and Marquette, Mich., *Schwarz;* Ottawa, *Harrington;* my specimens are from Massachusetts, *Blanchard.* Europe (the Alps).

352. **Necrobia rufipes** *DeG.*

This species and the two following are well known cosmopolites. *Rufipes* is found from Florida to Vancouver, and throughout Europe and Siberia. It is the notorious ham beetle, the pest of pork packing establishments, and the occasion of an interesting law suit. Riley, Missouri Rep. vi, 96; Heyden, 130.

353. **N. ruficollis** *Fab.*

This species is as widely distributed as *rufipes*, extending to Alaska. It does not seem to have occurred in Siberia. It lives mostly on carcasses. This beetle has attained celebrity as instrumental in saving the illustrious Latreille from transportation and consequent death.

354. **N. violaceus** *Linn.*

This species occurs nearly everywhere in North America, and is probably native as well as introduced, since it is spread over eastern and western Siberia Europe generally. An. Lyc. iv, 162; Col. Am. 113; Heyden, 130.

PTINIDÆ.

The species of this family here catalogued have been introduced from Europe, with perhaps one exception, being transported from place to place in articles of commerce.

355. **Gibbium scotias** *Scop.*

My specimens of this curious species are from New Orleans, Louisiana; Charleston, S. C., *Horn.* Central and southern Europe in old buildings.

356. **Trigonogenius gibboides** *Boisl.*

Found depredating on plants in the Calif. Acad. Sciences, *Harford in litt.* Europe. Sicily. Corsica. Algeria.

357. Ptinus fur *Linn., humeralis* Say.

This species inhabits old houses, natural history museums, etc., and occurs occasionally in all parts of our country to Alaska. It is common in Europe and Asia to Kamtschatka. Col. Am. 154; Heyden, 130.

358. P. brunneus *Duft., frontalis* Mels.

Occurs in the District of Columbia, where it is commonly bred from rats' dung by Mr. Pergande (Proc. Ent. Soc. Wash. i, 14). I take it here in Pennsylvania; Ohio, *Dury;* Missouri, *Schuster;* Texas, *Belfrage.* France. Germany. Southern Europe.

359. Ernobius mollis *Linn., convexifrons* Mels.

"A common European species introduced into the Atlantic States," *LeConte* (Pr. 1865, 224; Pr. 1861, 352). Melsheimer took it in southeastern Pennsylvania, and it occurs here; northern and southern Michigan, *Schwarz.* Europe. Barnaul on the Obi, west Siberia. Heyden, 131.

360. Xestobium tessellatum *Fab.*

"Introduced into the Atlantic States from Europe," *LeConte* (l. c. 227). I have seen no native specimens, nor record of occurrence. The specimens in Blanchard's and Horn's collections are from Massachusetts.

361. Sitodrepa panicea *Linn., tenuistriatum* Say, *obesum* Mels.

This is a cosmopolitan species common throughout North America to Alaska and Europe, and all Siberia to Kamtschatka. It is often a great pest in houses, stores and museums, l. c. 229; Can. Ent. xv, 92; Col. Am. 154; Heyden, 131.

362. Nicobium hirtum *Ill.*

Dr. LeConte had in his collection a specimen probably taken in Georgia, and Schwarz took one in Florida. I have observed no other record of its occurrence in this country. Europe (France. Spain. Italy). LeConte, l. c. 231.

363. Lasioderma serricorne *Fab.*

This species, according to Dr. LeConte, lives chiefly, though not exclusively, on tobacco (l. c. 238), and has been carried by commerce over the whole globe. Mr. Schwarz took it at Detroit, Mich. I have it from Louisiana, and have taken it here in Pennsylvania. It is probably common enough, but not generally recognized.

364. **Endecatomus reticulatus** *Hbst.*

Probably introduced from Europe into the Southern States, *Horn* (P. Am. P. xvii, 540. Central and southern Europe. Eastern Siberia. Heyden, 131; Heyden, 1886.

365. **Dinoderus substriatus** *Payk.*

This species appears to be native, and occurs particularly in the northern States and Canada, *Horn* (l. c. 549). Northern Michigan and Veta Pass, Col., at 9400 feet, *Schwarz;* Canada (*various collectors*), abundant in Alaska. Europe. The governments of Tomsk and Irkutsk, west and east Siberia. Heyden, 131; Mann., 1853.

366. **D.** (*Rhizopertha*) **pusillus** *Fab.*

Dr. Horn states: "This insect appears to be cosmopolite, having probably been distributed in articles of commerce. Numerous specimens were observed in the wheat at the Centennial Exposition. It probably occurs over our entire country, as I have specimens from Arizona," l. c. 550.

SCARABÆIDÆ.

367. **Onthophagus nuchicornis** *Linn., rhinoceros* Mels.

Melsheimer took this European species in Pennsylvania, and it is known to occur in New Brunswick, Rhode Island and the Magdalen Islands in the Gulf of St. Lawrence (Henshaw, Can. Ent. xix, 160). It also occurs in western and southeastern Siberia. Heyden, 103.

Obs.—O. ovatus *Linn.* The species in our literature so named is pennsylvanicus *Harold.*

368. **Aphodius fossor** *Linn.*

"Introduced from Europe into the New England States and Canada (*Horn*);" Mount Washington, N. H.; the Green Mountains, Vermont; Ottawa, Canada; Detroit, Mich. My specimens are from Trenton, Canada; eastern Siberia and Turkestan. Heyden, 104; see for this and all the following species Horn's Monograph, T. xiv, adde 4, *et seq.*

369. **A. erraticus** *Linn., pensvallensis* Mels.

This common European species "has been introduced, doubtless through commerce, into the Middle States (*Horn*), and is abundant in Druid Hill Park in Baltimore, and in the surrounding counties in Maryland (Lugger, P. W. i, 49). It occurs in eastern and western Siberia. Heyden, 103.

370. A. fimetarius *Linn.*, *nodifrons* Rand.

Also a common introduced European species found abundantly nearly every place east of the Rocky Mountains. "It will probably invade every portion of our territory (*Horn*)." In Asia it inhabits Turkestan, and eastern and western Siberia. Nord., 26; Heyden, 104.

371. A. aleutus *Esch.*, var. ursinus *Mots.* (Horn, T. xiv, 13)

"*Aleutus* occurs from the high regions of Colorado westward to California, Oregon, Washington and northward to Alaska (Leavenworth Valley and Alma at 10,000–11,000 feet, *Bowditch;* New Mexico, *Snow*)." Var. *ursinus* inhabits Kamtschatka and other places in eastern Siberia. Heyden, 105; Mann., 1853.

372. A. fœtidus *Fab.*, putridus *Herbst*, *tenellus* Say.

"Probably introduced from Europe, and occurs from the Atlantic coast to Colorado and New Mexico," *Horn*. It is much less common and abundant than *fimetarius* or *inquinatus*. It is an inhabitant of western Siberia. Heyden, 104; Nord., 26.

373. A. granarius *Linn.*, *aterrimus* Mels., *metallicus*, *spretus* Hald.

"Originally an inhabitant of Europe; this species has been spread by commerce throughout the world," *Horn*. It seems to inhabit the United States and Canada generally, though its northern extension is uncertain, but probably to a high latitude, since it occurs in eastern and western Siberia, Heyden, 104. In this instance, as in some others, we may possibly have the species as a native as well as by introduction.

374. A lividus *Oliv.*

"This species is widely distributed in the eastern hemisphere, and has been introduced in the West Indies, whence it has probably spread to our Southern States, extending west to New Mexico," *Horn*. I take it here though not abundantly. Siberia (Nikolaevsk), Heyden, 1885.

375. A. inquinatus *Fab.*, *maculipennis* Mels.

This species, introduced from Europe, is excessively abundant nearly everywhere east from the Rocky Mountains, and is likewise an inhabitant of eastern and western Siberia. Heyden, 105.

376. A. rufipes *Linn.*

This fine species occurs in the mountains of Pennsylvania, Maryland and North Carolina. Probably indigenous and not introduced, *Horn*, T. xiv, 53; Can. Ent. xx, 9 and 66. Inhabits Siberia (place not mentioned) and Europe generally. Heyden, 106.

377. A. depressus *Kug.*

One specimen was found in New York by Mr. A. Merkel, "and it is barely possible this may be an accidental introduction (*Horn*, l. c.)." It inhabits Europe generally, and is found in eastern and Arctic Siberia. Heyden, 106; Nord., 26.

378. A. prodromus *Brahm.*

"Occurs very commonly in Europe, and in our country has been collected by Prof. Fernald, Maine, and a specimen has been obtained from Montreal, Canada (*Horn*, l. c. 60)." It also occurs in western Siberia at Barnaul, on the Obi. Heyden, 105.

379. Oxyomus porcatus *Fab., opacifrons* Horn.

"Has evidently been introduced from Europe, where it is common, and in our country has been found near New York and Philadelphia (*Horn*, l. c. 65)." T. iii, 284.

380. Pleurophorus cæsus *Panz.*

This small species has probably been introduced from Europe into the Middle States, and has been taken abundantly near Baltimore by Mr. Lugger, and near Washington by Mr. Ulke (Horn, l. c. 91). T. iii, 291. In Asia it occurs in Turkestan. Heyden, 106.

381. Hybosorus Illigeri *Reiche, arator* Ill., *carolinus* Lec.

This species, common in southern Europe, has occurred in the Southern States, but is not common in collections. It also occurs in Asia in Turkestan (Sols. 76, 351). Heyden, 107. See a description by Dr. LeConte J. Acad. i, 84.

382. Trox scaber *Linn.*

This species is spread generally from the Atlantic to the Rocky Mountains. It occurs in western Siberia and Turkestan "and in every quarter of the globe," Horn, T. v, 11; Heyden, 108.

383. Tropinota hirta, *Poda hirtella* Linn., *Cetonia vestita* Say.

This species was described by Say from a specimen in the Philadelphia Museum, and another sent him by Dr. Wm. T. Harris, of Milton, Mass. Mr. E. P. Austin took a small number, in 1879, in Massachusetts, T. viii, p. xix. Its distribution in Europe is general, and it is found in western Siberia and Turkestan. Heyden, 113.

CERAMBYCIDÆ.

384. Tragosoma Harrisii *Lec.*

The authors of the Classification of the Coleop. of N. A. say (p. 274) that this scarcely differs from the north European T. dep-

sarium *Linn.*, and that it "occurs from New Foundland to Vancouver, but is not abundant (Coney Island, Bul. Brook. vii, 60; Mount Washington; Green Mountains; Ottawa, Canada; Buffalo, N. Y.; Detroit, Mich.; Lake Superior. My specimens are from New Mexico, Colorado and Utah)." *T. depsarium* inhabits Alpine and northern Europe, western and eastern Siberia. Heyden, 183; Col. Am. 153.

385. **Hylotrupes bajalus** *Linn.*, *bullatus* Hald.

Harris (Insects Injurious to Vegetation 88) supposes this species to have been introduced in its larva state in timber from Europe into the Eastern States, where it occurs near the sea-shore; Mr. Reinecke took it at Buffalo, N. Y. My native specimens are from Georgia and eastern Pennsylvania.

386. **Phymatodes variabilis** *Fab.*, *ventralis* Hald.

This species, with numerous named varieties is spread over Europe, from which it is supposed to have been introduced into this country. "Inhabits from Massachusetts to Alabama (*Hald*)." I take it here, and have seen it from Kansas and Wisconsin, and it is recorded from Buffalo, N. Y., and Detroit, Mich.; Arizona, *Horn in litt.*

387. **Callidium violaceum** *Linn.*

This Eur–Asiatic species is spoken of in our literature, but the specimens referred to it belong either to *antennatum* Newman, or *janthinum* Dej., which Dr. LeConte says are distinct from it, and valid species, J. A. P. ii, 34. Arctic, east and west Siberia; Amurland. Heyden, 184.

388. **Gracilia minuta** *Fab.*, *fusca* Hald.

Introduced from Europe in articles of commerce into the Eastern States, in which it occurs in various localities. I have taken it here twice; Buffalo, N. Y. (*Reinecke*); New York; Georgia.

389. **Neoclytus erythrocephalus** *Linn.*

This species occurs in Europe in Dalmatia and Istria in the Adriatic Sea. It is common here, and inhabits nearly every portion of our territory eastward from the Rocky Mountains.

390. **Acmæops pratensis** *Laich*, *strigilata* Fab., *fulvipennis* Mann., *longiceps* Kirby, *semimarginata* Rand.

This species is widely spread over the northern parts of America from Hudson Bay to Alaska, southward to Maine and northern Michigan, and down the Rocky Mountains to New Mexico (from which I have specimens), and northward to California. It occurs

in Alpine and northern Europe, and many portions of Arctic and eastern Siberia; the var. *ustulata* Gebler is found throughout eastern Siberia, and at Kamtschatka, and is the prevailing American form, l. c. 235; J. A. P. i, 312 and 323; Annals and Mag. Nat. Hist 1870, v; Col. Amur, 148; Heyden, 194.

391. Leptura (*Strangalia, Pachyta*) sexmaculata *Linn.*

This is likewise a northern species. My specimens are from Mt. Washington, N. H. From there it extends northward to the Hudson's Bay region and westward to northern Michigan and the Lake Superior region. *Vexatrix* Mann., formerly placed in synonymy, is a true species as shown me by Dr. Horn. Europe (Sweden, Finland). Western and eastern Siberia, J. A. P. i, 312 and 333; Col. Am., 148; Heyden, 195.

392. L. erythroptera *Kirby.*

A variety of canadensis *Fab.* is almost certainly variicornis *Dalman.* According to Mr. E. A. Schwarz (Ent. Am. ii, 161) *cinnamoptera* Hald. is a synonym. *Cribripennis* Lec. is another variety. From an examination of a number of specimens of each of the American forms I am led to believe the varieties named to be merely individual variations in a variable species. The species as a whole extends across the northern part of the continent from the Atlantic to the Pacific, and down the Rocky Mountains to New Mexico. Europe (northern Germany, Russia). Western and common in eastern Siberia to the mouth of the Amur. Col. Am. 147; Heyden, 196.

CHRYSOMELIDÆ.

393. Donacia dentata *Hoppe.*

This species remains unidentified in our fauna. It inhabits Europe and western Siberia. Heyden, 197.

394. Zeugophora scutellaris *Suff., subspinosa* Gebler.

Mr. Schwarz takes this species at Detroit, Mich.; my specimens are from northern Illinois. Its occurrence elsewhere has not been noted. Europe (France, Germany). Western Siberia. Heyden, 198.

395. Crioceris asparagi *Linn.*, var. *maculipes* Gebl.

Introduced from Europe about 1859 into Long Island, N. Y.; it is slowly spreading inland, and is abundant (Geneva, N. Y.; Baltimore, Md.; Fairfax Co., Va.) *Lugger.* For figures of it in all its stages; see Lintner's First Rep. N. Y. 239–46. It inhabits Europe and Siberia. Heyden, 198.

396. **C. 12-punctatus** *Linn.*

This recent importation from Europe was first observed in this country by Mr. O. Lugger, in 1881, near Baltimore, Md., feeding on asparagus. It is spreading "slowly and has now (1886) reached portions of Anne Arundel County, and even Washington City (*Lugger* P. W. i, 59)." It inhabits Europe and portions of western Siberia, and a variety, 10-*stigma* Suff., the Amur country in east Siberia. Heyden, 198.

397. **Adoxus vitis** *Linn.*

This species is widely distributed across the northern part of the continent, extending north from Mount Washington, N. H., to the Hudson Bay region, westward to Alaska and southward through the Rocky Mountains to New Mexico. I do not know of its occurrence in the Atlantic States south of New York. Central and northern Europe and through southwestern Siberia to the Amur region. Heyden, 204; Mann., 1853.

398. **Entomoscelis adonidis** *Pallas.*

This occurs everywhere through the Rocky Mountains at from 8000–11,000 feet, *Bowditch;* my specimens are from Montana; Hudson Bay region, *Kirby;* southern Europe. France. Germany. Western and eastern Siberia to Turkestan; Heyden, 208; Col. Am. 222.

399. **Prasocuris Phellandrii** *Lin.*

Illinois (*Crotch*), Ottawa, Canada, *Harrington;* Detroit, Mich, and Veta Pass, Col., at 11,500 feet, *Schwarz.* Europe. Western Siberia. Heyden, 209.

400. **Plagiodera (Phædon) cochleariæ** *Panz.*

Crotch referred two specimens in Dr. LeConte's collection without exact locality to this species (Pr. 1873, 53); no notice of its occurrence since has been observed, except that it is in Mr. Reinecke's Catalogue of Buffalo Coleoptera. Central and northern Europe. Common throughout all Siberia by the name armoraciæ *Linn.* Col Am. 224; Heyden, 209.

401. **Gastroidea polygoni** *Linn.*

A common and abundant species, occurring from Nova Scotia to the Mississippi on *Polygonum* (*aviculare*). Europe. Turkestan; eastern Siberia. Heyden, 208.

402. G. *raphani* Fab., viridula *DeG. ? formosa* Say.

This species was taken by the Richardson Expedition in lat. 54° and determined by Kirby to be *raphani*, which Dr. Horn thinks is probably correct, and is Say's *formosa*. It occurs in Kansas, *Snow;* Manitoba and New Mexico, whence I have specimens. Central and northern Europe. Western and eastern Siberia, Heyden, 208. Can. Ent. viii, 191.

403. Lina lapponica *Linn., interrupta* Fab.

This species is very variable in color and markings. It is usually found on the Salisaceæ, and especially the species of Salix. It is spread over the greater part of North America to Alaska. Europe. Common in Siberia, Mann., 1853; Col. Am. 224; Nord. 29; Heyden, 205.

404. L. tremulæ *Fab.*

Hudson Bay, *Crotch;* Mount Washington, N. H., *Austin;* northern Michigan, *Schwarz*. Northern Europe. Riley, in the Amer. Ent. 1880, 160.

405. Gonioctena arctica *Mann., affinis* ‡ Mann.

This species occurs abundantly in Alaska, and was taken on the Nelson and Churchill Rivers, Hudson Bay Territory by Dr. R. Bell. Mannerheim describes five color varieties. Mr. George R. Crotch considered it a probable variety of G. Linæana *Schrank, triandra* Suff., a species occurring in Arctic Siberia and southward to the Amur. Mann., 1852–53; LeConte Cat.; Pr. 1873, 52; Heyden, 208; Col. Am. 223.

406. G. pallida *Lin.*

Also very variable in color, sculpture and markings. Kirby's *rufipes* is placed in synonymy by Dr. Horn. Occurs in the Hudson Bay region, *Kirby;* York Factory, Hudson Bay and Norway House to Oxford House, *LeConte Cat.;* Lake Superior, *LeConte;* Marquette, Isle Royal, Bachewauung Bay, *Schwarz*. Central and northern Europe. Western Siberia. Heyden, 208. Can. Ent. viii, 191.

407. G. viminalis *Lin.*

Alaska, *fide* Ménétriés. Arctic and western Siberia to the Amur countries. Mann., 1853; Heyden, 108.

408. Phyllodecta vulgatissima *Linn., ? interstitialis* Mann.

Occurs here abundantly on *Salix longifolia;* Mount Washington, N. H.; Ottawa, Canada; Buffalo, N. Y.; Detroit, Mich.; Lake

Superior region; Cincinnati, Ohio. *Interstitialis* occurs in Alaska. Europe. Turkestan; eastern and western Siberia. Nord., 30; Heyden, 209.

409. P. vittellinæ *Linn.*

Lake Superior, *fide* Kirby, *LeConte;* Ontario, *Bethune;* taken in the Richardson Expedition, *Kirby.* Can. Ent. viii, 191. Europe. Arctic and western Siberia; the Amur countries. Nord., 30; Heyden, 209.

410. Agelastica halensis *Linn.*

Two specimens of this fine European species were once received by Dr. LeConte, which were said to have been taken at Farmington, Conn., but further notice of its occurrence has not been observed. Common in Europe. Western Siberia. Pr. 1865, 210; Heyden, 211.

411. Galeruca marginella *Kirby,* var. *punctipennis* Mann., ? var. *luctuosa* Mann.

Dr. LeConte and Crotch unite in saying that this species is probably inseparable from nymphææ *Linn.* (Pr. 1865, 217; Pr. 1873, 55). Kirby described it from a single specimen taken in lat. 65°, and LeConte referred to it one from Fort Simpson, Hudson Bay Territory (Kirby, 220); *punctipennis* occurred in California; *luctuosa* in Alaska; *nymphææ* is common in Europe. Western Siberia. Heyden, 210.

G. sagittariæ Gyll., a var. of *nymphææ* Linn., occurs from Virginia northward to Hudson Bay and Manitoba regions and westward to Kansas. It inhabits Europe Western and eastern Siberia, and the Amur country (*LeConte Cat.*). Heyden, 210; Col. Am. 232.

412. G. *xanthomelaena* Schrk., crataegi *Forst.*

This beetle has been imported from Europe into the Eastern States, and is in some places very abundant and destructive to the Elm; as yet, it has not occurred west of the Allegheny Mountains. Turkestan. Heyden, 210.

413. Crepidodera rufipes *Linn., erythropus* Mels.

This species is excessively abundant here. "Middle and Southern States," Crotch, Pr. 1873, 71. Ohio, *Dury;* Kansas, *Popenoe.* Europe.

414. C. helxines *Linn., nana* Say, *violacea* Mels., *æreola* Lec., *opulenta* Lec.

This species is subject to variation; it extends from the Atlantic to the Pacific and is very abundant. Inhabits Europe and western Siberia. Heyden, 211; Nord., 30; Chabarofka, Heyden, 1885.

415. C. Modeeri *Linn.*, var. *maculata* Lec.

Hudson Bay, *Crotch;* Detroit and Marquette, Mich., *Schwarz;* *C. maculata* California, *LeConte;* Oregon, *Crotch;* Kansas, *Popenoe.* Europe. Western and Arctic Siberia. Nord., 30; Heyden, 211.

416. Phyllotreta sinuata *Steph.*, *Zimmermanni* Crotch.

Missouri, *Riley, Crotch;* Detroit, *Schwarz.* Europe. Eastern Siberia. Heyden, 211.

BRUCHIDÆ.

417. Bruchus rufimanus *Sch.*

This species was once bred from pea-pods imported from Switzerland (T. iv, 313), but no other record has been observed, except one which I know to be in error.

418. B. pisi *Linn.*

"Abundant over nearly the entire globe wheresoever peas are cultivated," *Horn*, l. c.

419. B. scutellaris *Fab.*

"This species appears to have been widely distributed over the entire globe (Horn, l. c. 318)." Chinensis *Linn.* is the name it bears in Europe, denoting its Asiatic origin. My native specimens are from Louisiana and Florida.

420. B. obsoletus *Say, obtectus* Say, *fabæ* Riley.

This species occurs in many places eastward from the Rocky Mountains depredating especially on beans (T. iv, 337; Riley, Missouri Rep. iii, 52, etc.). It was found in beans from various European countries in the Centennial Building at Philadelphia, but I have not observed the name on any European catalogue. Pr. 1876, 269.

TENEBRIONIDÆ.

421. Blaps mucronata *Latrl.*

A few specimens of this European species occurred near Baltimore, Md., *Horn.*

422. B. similis *Latrl.*

This is also another common European species that occurred at Alexandria, Va., very abundantly. Native specimens of these species were compared with the European by Dr. Horn in his recent visit to Europe, and any previous doubts about their correct identification is now dispelled; they are the two commoner English species. Can. Ent. xvi, 37; xxi.

423. **Upis ceramboides** *Linn., reticulata* Say.

This species inhabits the northern portion of the continent from Hudson Bay southward to New Hampshire (Nova Scotia, *Harrington in litt.;* New York, Michigan, Wisconsin, Manitoba, Montana . Germany. Northern Europe. Eastern Siberia, the Amur basin. Tr. Am. Phil. Soc. xiv, 338; Col. Am. 139. Iarzowa Selo, Jenisei, lat. 60° 10′. Nord., 27; Heyden, 146.

424. **Tenebrio obscurus** *Fab., tristis* Hald.

This common European species has been introduced into this country by commerce, and is spread from the Atlantic to the Rocky Mountains; also in eastern and western Siberia, l. c. 345; Heyden, 146.

425. **T. molitor** *Linn.*

This species has likewise been introduced from Europe by commerce, and occurs all over the United States and Canada from Nova Scotia to Alaska, and southward to Mexico, depredating on flour and stored grain. Eastern and western Siberia. Heyden, 146.

426. **Tribolium ferrugineum** *Fab.*

This and the five following species have been introduced by commerce, and are found where flour and grain are stored. The occurrence of this species in this country is noted in various places from Florida to Alaska. Europe. Lintner gives a good account of it in 2d Rep. State Entomologist, N. Y., p. 136–39.

427. **T. madens** *Charp.*

Though widely distributed in this country, this species does not appear to be common. I have specimens from New Mexico and Hamilton, Canada; Ottawa, *Harrington;* Marquette, Michigan, *Schwarz.* Europe.

428. **Gnathocerus cornutus** *Fab.*

Occurred in California, inside of an army biscuit, Horn, l. c. 326; Alaska, Mann., 1852. Notice of other occurrences has not been observed. Europe.

429. **Echocerus maxillosus** *Fab.*

This species is common here, and in many places throughout the United States and Canada (Florida; Cincinnati; Detroit; Milwaukee; Alaska).

430. **Alphitobius diaperinus** *Panz.*

This species is likewise found here in feed stores. I have specimens from Florida; Cincinnati, *Drury;* Horn, l. c. 369.

431. *A. piceus* Oliv., **mauritanicus** *Fab.*

My specimens are from St. Augustine, Fla., and New Orleans, La.; Philadelphia, Pa., Horn, l. c. Alaska, Mann., 1852.

MELANDRYIDÆ.

432. **Xylita lævigata** *Hellen., decolorata* Rand., *buprestoides* Payk., *discolor* Fab.

This species is apparently not abundant. It inhabits Maine, Canada, the Lake Superior region; Cincinnati, *Dury*. Central and northern Europe. Western Siberia, Heyden, 148; var. (*nigricans*) punctulata *Mhm.* Arctic Siberia, Heyden, 224.

433. **Serropalpus barbatus** *Schall., striatus* Hellen., *substriatus* and *obsoletus* Hald.

This species is distributed over the northern part of the continent from Maine (my specimens are from there) to Alaska (New York, Canada, Michigan, Lake Superior region, Manitoba, Oregon). Central and northern Europe. Western and eastern Siberia. Heyden, 148; Mann., 1852.

434. **Hypulus** (*Phlœotria, Dircæa*) **vaudoueri** *Muls., fusca* Lec.

("Widely diffused, but not commonly met with. Extends across the continent from Nova Scotia to California, and as far south as North Carolina," Horn, T. xv, 41) Michigan, *Schwarz;* Lake Superior, Virginia and North Carolina, *LeConte.* Two specimens occurred here. Europe (France).

PYTHIIDÆ.

435. **Pytho americanus** *Kirby, deplanatus,* Mann.

("This species occurs from Canada to North Carolina, and in our fauna represents, and may even be identical with *depressus* Linn." Horn, l. c. 46) Cincinnati, Ohio; Kansas (whence my specimens); Buffalo, N. Y.; Ottawa, Canada; Marquette, Mich.; Wisconsin; Alaska. *Depressus* occurs in Alpine and northern Europe; Arctic to the southern parts of eastern and western Siberia. Heyden, 156; Nord., 28.

ŒDEMERIDÆ.

436. **Nacerdes melanura** *Linn., Oedem. apicalis* Say.

According to Say this species is found in Pennsylvania, Louisiana and other parts of the Union. Two specimens occurred to me here; Cincinnati, Ohio, *Dury;* Kansas, *Snow.* Nova Scotia, *Harrington,*

in litt.; California; Yucatan, *Horn, in litt.* No other record has been noticed, and I have never met with it on an exchange list. Europe and western Siberia; Turkestan, Heyden, 156.

ANTHICIDÆ.

437. **Anthicus floralis** *Linn., basillaris* Say.

This, like some other species of the genus, is very variable. It occurs here, and is spread generally from the Atlantic to the Pacific, extending as far north as the Lake Superior region. Probably imported in articles of commerce. P. vi, 92 and 98. Europe. Turkestan, Heyden, 149.

PYROCHROIDÆ.

438. **Pyrochroa fuscicollis** *Mann.*, var. *punctum* Motsch.

Specimens from Alaska have lately been seen by Dr. Horn, T. xv, 48. Eastern Siberia to Kamtschatka, Heyden, 149. Motschulsky describes it and gives a colored figure. Col. Am. 143.

OTIORHYNCHIDÆ.

439. **Barynotus Schoenherri** *Zett.*

Occurs in New Foundland. Europe (Sweden; Lapland). Mon., 22. Nativity in doubt.

440. **Brachyderus incanus** *Linn.*

This species, introduced from Europe, has occurred at St. Louis, Mo. C. 439.

441. **Otiorhynchus sulcatus** *Fab.*

"Occurs in Massachusetts; Canada; New Foundland; Nova Scotia," Horn, Mon. 61; New York. It also occurs here in Pennsylvania rarely. Introduced from Europe, where it inhabits the central and northern countries.

442. **O. ovatus** *Linn., ligneus* ‡ Lec.

This is an aggressive beetle; introduced originally from Europe into the New England States, probably in cemetery shrubbery; it has spread westward to Chicago, Ill., from a cemetery near which I have specimens. Nova Scotia, *Harrington in litt.*; Ottawa, Canada; Detroit, Mich. Abundant here, and known popularly as *the graveyard bug.* It also inhabits Arctic Siberia on the Jenisei, and the more southern parts of western Siberia. Heyden, 157; Horn, l. c. 61; Nord., 28.

443. O. rugifrons *Gyll.*

This species, which inhabits Austria and northern Europe, has been introduced, and "occurs in the Middle States," Horn, l. c. 62.

444. O. maurus *Gyll., nodosus* Fab.

Occurs in Greenland, and in Alpine and northern Europe, and with the following species is considered to be native. Horn, l. c. 62.

445. O. monticola *Germ., arcticus* Fab.

Occurs also in Greenland, and in Alpine and boreal Europe. Horn, l. c. 62.

446. Phyllobius glaucus *Scop., calcaratus* Fab.

Taken once in Canada, and its occurrence may have been accidental. Horn, l. c. 104. No record of its further occurrence has been observed. Europe.

447. Sciaphilus muricatus *Fab.*

This common European species has been found at Brookline, Mass., by Mr. F. C. Bowditch, who took it on *Populus balsamifera*. Psyche v, 137.

448. Strophosomus coryli *Fab.*

This is likewise common in Europe. It was also taken by Mr. Bowditch at Brookline by sifting, and by Mr. H. B. Bailey, at South Orange, N. J., on *Betula lenta*. Psyche v, 137. I have specimens taken in one of the New England States in July, 1888.

CURCULIONIDÆ.

449. Sitones lineellus *Bond., indifferens* Say, *scissifrons* Say.

Occurs in Kansas and Texas, *LeConte*. Dr. LeConte considered this and the species of *Sitones* following to have been introduced with *tibialis* in doubt. The genus is as yet unstudied in this country and the species are now in a state of confusion, badly confounded. The present species inhabits Germany and the Amur country. Heyden. 161; Mon. 114.

450. S. hispidulus *Germ.*

Occurred abundantly at Long Branch, N. J., about the roots of the grass growing on sand-hills, l. c. 413. New Jersey and Pennsylvania, *Casey*. It is general in Europe and Siberia. Heyden, 161.

451. S. flavescens *Marsh., caninus* Gyll.

This species has a wide distribution. It occurs here, and I have it from St. Augustine, Fla., and from northern Iowa, Ohio, Indiana, Illinois, Marquette and Detroit, Michigan, *Schwarz;* New York,

Reinecke; Canada and Nova Scotia, *Harrington.* It is general in Europe. Asia (Turkestan, Mongolia, western Siberia). Heyden 161; depredates on several species of *Trifolium.*

452. S. tibialis *Herbst.*, var. *ambigua* Schon.

This species is likewise widely diffused, and is probably native, occurring from Canada to Vancouver, and down the Rocky Mountains to New Mexico (Kansas, Dacota, Hudson Bay Territory, Canada, *LeConte;* New York, *Reinecke;* Kansas and New Mexico, *Snow;* Michigan and everywhere in the mountains of Colorado at from 7000–11,500 feet, *Schwarz;* Vancouver, *Taylor*). Europe. Crimea. Turkestan. Heyden, 161. There are many varieties.

453. S. crinitus *Oliv.*

Oregon and California, *LeConte;* l. c. 115. Europe. Siberia. Amurland. Heyden, 161; Chabarofka, Heyden, 1887.

454. Phytonomus punctatus *Fab.*, *opimus* Lec.

This European insect, though probably imported into the United States many years ago, has since 1881 multiplied to such an extent in some of the northern and western counties of New York as to destroy whole fields of clover, for which it seems to have acquired a taste; specimens occurred here, but on what is not known. It reached Canada 1884. T. ix, p. xxxvi; Lintner, 1st Rep. 247, Can. Ent. xvi, 144, 182, 209, 215. It inhabits Europe generally, and is found in the southeast part of western Siberia. Heyden, 165.

455. P. elongatus *Payk.*

Inhabits Greenland. Central and northern Europe and western Siberia. Mon. 125; Heyden, 166.

456. P. nigrirostris *Fab.*

Has been imported into some of the Eastern States from Europe, and appears to have a taste for clover. Massachusetts, *Blanchard;* Michigan, *Schwarz;* Canada, *Harrington;* New Brunswick, *Fletcher.* Can. Ent. xvi, 215, 217.

457. Lepyrus colon *Linn.*, var. 4-*notatus* Bohm.

This fine species inhabits the colder regions of both hemispheres. In this country Mount Washington, N. H., *Austin;* Hudson Bay region, lat. 65°, *Kirby;* and the Nelson and Churchill Rivers, *Bell;* New Mexico, *Horn*, list of insects taken by Thomas; my specimens are from northern Wisconsin, where it seems abundant. Europe and western Siberia. The var. 4-*notatus* occurs in Arctic Siberia. Heyden, 174.

458. **Hypomolyx** (*Hylobius*) **piceus** *DeG.*, *pineti* Fab., *pinicola* Coup., *heros* Lec. (undescribed) *L. S.*

This is another fine northern species. Michigan, *Schwarz;* Lake Superior; Hudson Bay Territory and Canada, *LeConte.* Central and northern Europe. Western and eastern Siberia. Mon., 139; Heyden, 174; Nord., 28; Heyden, 1885.

459. **Grypidius equiseti** *Fab.*

This species inhabits in Canada, Kansas and on the north shore of Lake Superior, *LeConte*, l. c. 163; Michigan, *Schwarz;* Ottawa, Canada, *Harrington;* Hamilton, Canada (my specimens). Europe. Arctic and west Siberia. Dauria. Heyden, 174; Nord., 28.

460. **G. brunnirostris** *Fab.*

Occurs in Oregon, Mon. 163; Veta Pass, Colorado, at 9200 feet, *Schwarz;* my specimens are from Wyoming. Northern and central Europe.

461. **Tanysphyrus lemnæ** *Fab.*

This minute beetle is excessively abundant here in all ponds that produce *Lemna.* Michigan, *Schwarz;* Canada, *Harrington.* Mon., 178; Can. Ent. xvi, 136. Europe.

462. **Acalyptus carpini** *Herbst.*, var. *sericeus* Gyll.

This species is as yet not very well known by collectors (see description P. Am. P. Soc. xvii, 621). It occurs in Michigan and Massachusetts and at York Factory, Hudson Bay (*Lec. Cat.*); Ottawa, Canada, *Harrington in litt.* I take it here and have it from Illinois, Amurland (Chabarofka). Heyden, 1887. Europe.

463. **Elleschus bipunctatus** *Linn.*

This is a European species found in Canada and Michigan. It is very abundant here in Pennsylvania, in June, on a small upland *willow,* l. c. 621; Can. Ent. xvi, 107.

464. **Nanophyes pallidulus** *Grav.*

This species has occurred in Louisiana, and Mr. Schwarz took it at Alamosa in the Rocky Mountains. Europe (Italy and southern France).

465. **Cionus scrophulariæ** *Linn.*

This European species occurred to Say, and a specimen collected in Louisiana was sent to Dr. Horn, Mon. 220. No other notice has been observed. It is also found in western Siberia. Heyden, 177.

466. **Gymnetron tetrum** *Fab.*

Introduced from Europe into Pennsylvania this species has spread to West Virginia, eastern Ohio, New York (*Reinecke*), southern Michigan, *Schwarz;* Canada, *Harrington.* It lives only on *Verbascum thapsus*, Mon. 220. It occurs in the southern parts of western and eastern Siberia. Heyden, 177.

467. **Cryptorhynchus lapathi** *Linn.*

This fine European species has become naturalized, having been taken near West Bergen, N. J., near Williamsbridge, N. J., and on Staten Island, N. Y., by Mr. Julich, Ent. Am. iii, 123. Asia (western and eastern Siberia; Amurland; Kirghis Steppes). Heyden, 176.

468. **Cnemogonus epilobii** *Payk.*

British Columbia and Great Slave Lake, Mon. 269. Marquette and Isle Royal in Lake Superior, *Schwarz.* Northern and central Europe.

469. **Ceutorhynchus rapæ** *Gyll.*

Canada, Middle and Western States, Mon. 274 (Illinois, Michigan, New York, Kansas, *Snow*). Central and northern Europe.

470. **C. cyanipennis** *Illig., Germ.*

This species of Central and southern Europe has lately been taken at Ithaca, N. Y., and also near Baltimore, Md. Ent. Am. v, 57.

Obs.—*Phytobius velatus* Beck, mentioned by Dr. LeConte should be omitted. Dr. Horn has recently examined the specimen in cab. LeConte and finds it to be the new species referred to by Schwarz. Pr. Ent. Soc. Wash. i, p. 76, and not *velatus.*

471. **Rhinoncus pericarpius** *Linn., triangularis* Say.

This European species is widely distributed eastward from the Rocky Mountains, but is restricted to localities, Kansas, Illinois, Indiana, Michigan, Ohio, Pennsylvania, Canada, *Harrington in litt.* Asia (west Siberia; Turcomania; var. *conjectus* Sch. Siberia). Heyden, 178.

472. **R. pyrrhopus** *Boh.*

Abundant from the Atlantic to New Mexico on various *Polygonum.* Individually there is much variableness in color, and in the coarseness of the thoracic punctuation. Amurland (Chabarofka). Heyden, 1887.

BRENTHIDÆ.

473. **Cylas formicarius** *Fab., Otidocephalus elegantulus* Summers.

This singular insect lives on the roots of the sweet potato, and occurs in the Southern States (Florida, Louisiana), from which I have specimens. Cuba. Madagascar. India. Cochin China. Mon. 327.

CALANDRIDÆ.

474. **Calandra oryzæ** *Linn.*

This species is cosmopolite, and in this country is distributed from Florida to Alaska, depredating on grain of all kinds. Siberia and the Amur country to Kamtschatka. Heyden, 179.

475. **C. remotepunctata** *Gyll.*

This species extends from Florida to Vancouver, whence I have specimens. I have specimens from Europe labeled *granaria*. It also depredates on grain.

476. **C. granaria** *Linn.*

I have seen no native specimes of this European species. It occurs in Missouri, according to Mr. C. V. Riley, depredating on wheat. Mon. 333; Canada, *Harrington in litt.* Resembles the preceding closely.

SCOLYTIDÆ.

477. **Hypothenemus eruditus** *West., hispidulus* Lec.

This species is spread by commerce. I find it here depredating on various foreign nuts in the shells of which it breeds. Its native country is now unknown.

478. **Xyloterus bivittatus** *Kirby, rufitarsus* Kirby (*LeConte*), *cavifrons* Mann.

"Maine, Canada. Vancouver Island, Alaska." Mon. 357. Mt. Washington, N. H.; Ottawa, Canada; Hudson Bay region, *Kirby;* Lake Superior; Colorado; New Mexico. Mr. Schwarz, a competent authority in this family, agrees with Mr. Eichoff in considering this a synonym of *X. lineatus* Oliv., a species of central and northern Europe. Ent. Am. ii, 41. Siberia, Heyden, 183.

479. **Xyleborus xylographus** *Say, saxeseni* Ratz.

A comparison of specimens is necessary to confirm this synonymy, *Schwarz.* Ent. Amer. ii, 41.

480. **Cryphalus jalappæ** *Letz.*

This species is widely distributed by commerce, and its native country is now unknown. Its occurrence in this country is probably only occasional.

481. Coccotrypes dactyliperda *Fab.*

Which lives in dates and areca nuts, is sometimes brought into this country with these fruits. Ent. Am. ii, 42.

482. Dryocetes *septentrionis* Mann., autographus *Ratz.*, *semicastaneus* Mann.

"Alaska. Canada. Virginia; under pine bark," Mon. 361. Mr. Schwarz took it at Detroit, Mich., and in the Lake Superior region, and agrees with Eichoff's synonymy. Ent. Am. ii, 42.

483. Scolytus rugulosus *Ratz.*

This is a species probably introduced from Europe, and in many places from the Atlantic to the Mississippi; is very destructive to peach, cherry and other fruit trees. Another species, so much like it as to be separable only by microscopy, breeds in dead hickory limbs. Can. Ent. xvi, 161; xvii, 48; Pr. Ent. Soc. Wash. i, 30. Turkestan, Heyden, 182.

484. Crypturgus *atomus* Lec., pusillus *Gyll.*

"Canada, Massachusetts, New York; under bark of dead pine branches. Length .04 inch." Mon. 387; Ent. Am. ii, 56. Europe.

485. Hylurgops *pinifex* Fitch, *Hylastes* glabratus *Zett.*, *decumanus* Er.

"Lake Superior, Canada, Ohio." Mon. 390; Ent. Am. ii, 56. Eastern Siberia; the Amur country, Heyden, 182; Col. Am. 156. Europe.

486. Hylastes trifolii *Mull.*

This European beetle was first discovered in this country in 1878 in Yates Co., N. Y., depredating on clover, and is spread somewhat in western New York. Lintner, 1st Rep. N. Y., 247; Riley, Rep. Dep. Agricult. 1878; Am. Entomologist iii, 180.

ANTHRIBIDÆ.

487. Aræocerus fasciculatus *DeG.*, *coffeæ* Gyll., *capillicornis* Say.

This species is cosmopolite, being carried from place to place by commerce. In this country it occurs in many places on both sides of the continent. I have specimens from Florida, New York and Oregon.

Corrigenda et Addenda.

Page 91, for vol. ii, *read* vol. xii, part iii.
No. 41, for also in California, *read* in Nova Scotia.
No. 55, for 4-*lineatus*, read 10-*lineatus*.
No. 70, after France, *add* Finland.
No. 175, for Redemont, *read* Piedmont.
No. 264, add Vorogova. Arctic Siberia. Nord., 26; Heyden, 222.
No. 323, insert DASCYLLIDÆ above 324.

The number of families represented in this catalogue is 50; number of genera, 261; number of species, 484, three numbers in the catalogue not representing Europa-American species. Of this number 328 occur in Asia, 40 of which are not recorded, so far as I have observed, with a European habitat.

An opinionative estimate of the derivation of these species is: native, 278; introduced (from Europe, except three), 156; in doubt, 50. Of the introduced species about 60 are insects of commerce, leaving 96 as the number of accidental importations. Of these many are naturalized beyond a doubt, but others are still on probation.

NOTE.—74. **Agabus longulus** is not the same as *A. dissimilis*, comparison with the LeConte type having been made by Dr. Horn while this was passing through the press.

The following species should be dropped from American catalogues:

10. Notiophilus aquaticus (perhaps a wrong determination).
11. Leistus piceus.
96. Sphæridium scarabæoides.
120. Tachyusa pygmæa.
202. Oxytelus depressus.
212. Amphichroum canaliculatum (a wrong determination).
349. Opilus domesticus.
393. Donacia dentata.
410. Agelastica halensis.
446. Phyllobius calcaratus.

Species requiring further records of occurrence to admit them to a permanent place in our faunal lists:

14. Nebria nivalis.
38. Licinus silphoides.
61. Hydroporus obscurus.
63. H. glabriusculus.
92. Helophorus granularis.
99. Cercyon melanocephalum.
131. Myllæna minuta.
138. Staphylinus erythropterus.
139. S. cæsareus.
143. Philonthus politus.
150. P. quisquiliarius.
161. Xantholinus punctatus.
163. Leptacinus parumpunctatus.
179 Pæderus riparius.
206. Coprophilus striatulus.
221. Homalium rivulare.
236. Adonia constellata.
261. Læmophlœus alternans.
291. Cercus bipustulatus.
326. Cyphon coarctus.
345. Anthaxia salicis.
377. Aphodius depressus.
383. Tropinota hirta.
387. Callidium violaceum
400. Plagiodera cochleariæ.

Species requiring further comparison to establish their identity:

45. Platynus Mulleri = *planipennis*.
48. Blechrus glabratus = *nigrinus*.
Hydrovatus cuspidatus = *pustulatus*.
Rhantus Grapii = *sinuatus*.
133. Acylophorus glabricollis = *pratensis*.
171. Stenus canaliculatus = *congener*.
198. Pseudopsis sulcata = *columbica*.
237. Hippodamia parenthesis = *amœna*
241. Coccinella nivicola = *monticola*.
243. C. 11-punctata = var. *menetriesi*.
264. Dendrophagus crenatus = *glaber*.
275. Dermestes bicolor = *elongatus*.
302. Ips 4-guttatus = *fasciatus*.
342. Chalcophora mariana=*virginiensis*
343. Melanophila appendiculata = *longipes*.
402. Gastroidea viridula = *formosa*.
405. Gonioctena Linnæana = *arctica*.
435. Pytho depressus = *americanus*.
479. Xyleborus xylographus = *saxeseni*

INDEX TO FAMILIES.

FAMILY.	Number.	Genera.	Species.	FAMILY.	Number.	Genera.	Species.
ANTHICIDÆ	437	1	1	HYDROPHILIDÆ	92	5	11
ANTHRIBIDÆ	487	1	1	LAMPYRIDÆ	346	2	2
BRENTHIDÆ	473	1	1	LATHRIDIIDÆ	303	4	10
BRUCHIDÆ	417	1	4	LEPTINIDÆ	105	1	1
BUPRESTIDÆ	342	3	4	MALACHIDÆ	348	1	1
BYRRHIDÆ	320	3	4	MELANDRYIDÆ	432	3	3
CALANDRIDÆ	474	3	3	MONOTOMIDÆ	316	1	3
CARABIDÆ	1	25	52	MYCETOPHAGIDÆ	271	2	2
CERAMBYCIDÆ	384	8	9	NITIDULIDÆ	290	9	13
CHRYSOMELIDÆ	393	15	24	ŒDEMERIDÆ	436	1	1
CLERIDÆ	349	4	6	OTIORHYNCHIDÆ	439	6	10
COCCINELLIDÆ	235	6	13	PHALACRIDÆ	234	1	1
COLYDIIDÆ	249	1	2	PLATYPSYLLIDÆ	104	1	1
CRYPTOPHAGIDÆ	266	4	5	PSELAPHIDÆ	112	1	1
CUCUJIDÆ	252	7	14	PTINIDÆ	355	10	12
CURCULIONIDÆ	449	15	24	PYROCHROIDÆ	438	1	1
DASCYLLIDÆ	324	1	3	PYTHIDÆ	435	1	1
DERMESTIDÆ	273	4	13	RHYSODIDÆ	251	1	1
DERODONTIDÆ	319	1	1	SCARABÆIDÆ	367	7	17
DYTISCIDÆ	54	11	36	SCOLYTIDÆ	477	10	10
ELATERIDÆ	327	6	15	SILPHIDÆ	106	5	6
ENDOMYCHIDÆ	248	1	1	STAPHYLINIDÆ	113	48	114
GYRINIDÆ	90	1	2	TENEBRIONIDÆ	421	7	11
HALIPLIDÆ	53	1	1	TRICHOPTERYGIDÆ	227	3	7
HISTERIDÆ	286	3	4	TROGOSITIDÆ	313	3	3

A study of the distribution of the species here presented must have an important bearing in the study of the ancient geography of the Northern Hemisphere. The large number of native species in common and the intimate relationship between the Coleoptera of northwestern America and northeastern Asia is brought out very prominently, while on the other hand the paucity of native common species on both the Atlantic coasts is as plainly presented. Both Drs. LeConte and Horn have frequently adverted to this in their writings, and this merely furnishes statistic proof.

Palæontological geography cannot be entered on here; suffice it to say that, from coleopterological considerations, the indications are that Europe and America were formerly as widely separated by water as they now are; that eastern and western North America were divided by water centrally (the northeastern part probably submerged in whole or in part); that the area now occupied by Behring Sea from Kamtschatka to Alaska and far west of the Aleutian Islands was land, and possessed a more temperate climate than at present.

I cannot better close this paper than by referring to several papers by Dr. LeConte relating to distribution, palæontology, etc.:

1. On certain Coleoptera indigenous to the eastern and western continents, An. Lyc. iv, 159, etc.

2. On the parallelism, equivalents and analogues of American and European, Arctic and sub-Arctic forms, etc., L. S. 239, etc.

3. Observations, *inter alia*, on the much greater number of genera and species common to both continents on the Pacific than on the Atlantic sides, P. R. R. 1 *et seq.*

4. Tables relating to transcontinental distribution, J. iv, 9 *et seq.*

5. Address to the American Association for the Advancement of Science (contains much valuable palæontological matter), American Naturalist, ix, 481, etc.

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My most sincere thanks are extended to Mr. W. H. Harrington and Mr. F. Blanchard for manuscript records of distribution; to Dr. George H. Horn for valuable suggestions and much unrecorded distribution, and especially for his kindness in supervising and correcting the proof sheets; and lastly to Mr. Charles S. Blake, the scientific compositor, whose work has been so perfect as to scarcely require correction.

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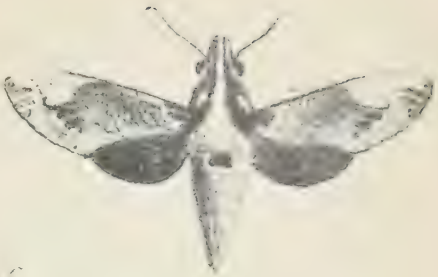

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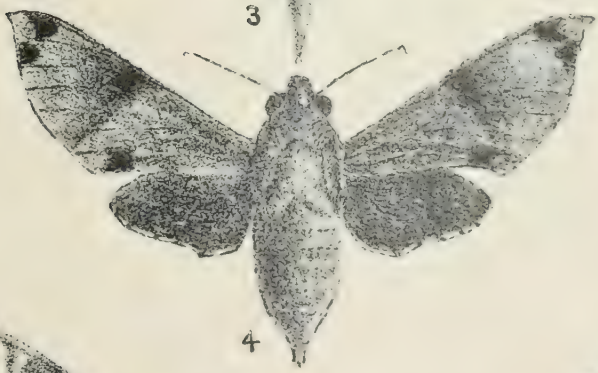

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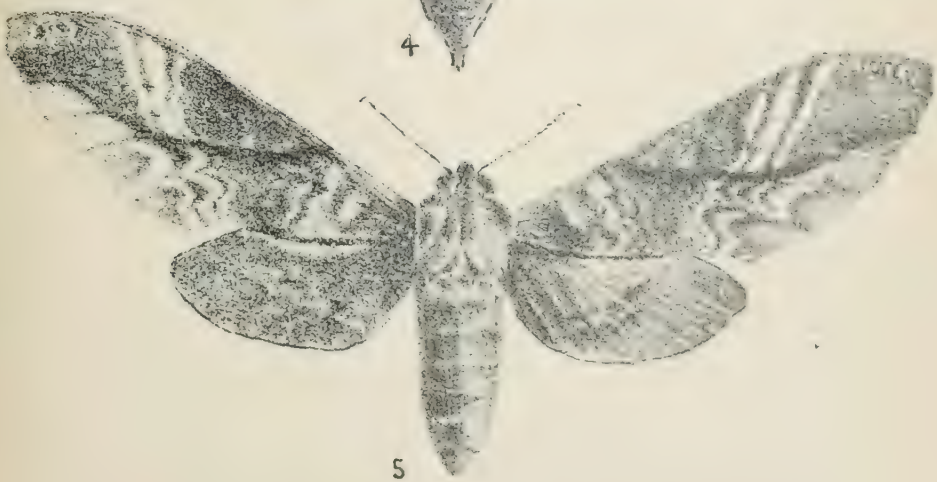

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W. J. HOLLAND, DEL. ET LITH

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W. J. HOLLAND, DEL. ET LITH

A synopsis of the HALTICINI of Boreal America.

BY GEORGE H. HORN, M. D.

The insects which constitute the study in the following pages have never been dealt with in any systematic manner. The nearest approach was by Mr. Crotch (Proc. Acad. 1873), whose object seemed to be rather the description of some of the more striking forms than a conscientious study of the material before him.

The European species have been the subject of distinct studies by Allard, Foudras and Kutschera, while at the present time a fourth work is in progress by Weise (Insecten Deutschl. vol. vi) and now nearly completed. While all of these have great merit, the last named author has been enabled to profit by the studies of his predecessors in a manner that leaves but little to be desired regarding the species of central Europe.

Our species have been dealt with in an isolated manner, a few having been described at a time by Fabricius, Olivier, Illiger, Say, Melsheimer and LeConte, while in the work of Crotch, supplemented by the Check List, gave, in accessible form, the approximately correct generic position of the species which had nearly all been described as Haltica.

Chapuis has given (Genera xi) an interesting account of the development of the tribe from the first suggestion of Altica by Geoffroy to his own time, to which those interested may refer, it being deemed unnecessary in an essay purely faunal to repeat what he has so well said.

The Halticini constitute a portion of a larger tribe, and are defined by the structure of the posterior femora, which are more or less dilated, often greatly so, giving to its possessors the power of jumping, from which the older authors adopted the designation *Saltatoriæ*.

The subdivision of the genera into groups is practically that adopted by Chapuis, although certain changes have been made by the partition of several of his groups, which will be explained in their proper places. Of the nineteen groups suggested five only lack

representation in our fauna (*Elithiites*, *Amphimelites*, *Acrocryptites*, *Oxygonites* and *Nonarthrites*), while three additional groups are suggested: *Pseudolampses*, *Disonycha* (by division of Halticæ) and *Systenæ* (by division of Crepidoderæ).

Probably the most important character for the subdivision of the groups is found in the structure of the anterior coxal cavities, whether open behind or closed. This seems to divide the entire series in two cohorts containing in each genera which form parallels and agree in the possession of characters of secondary importance. As an illustration we have the Monoplati, Crepidoderæ and Chætocnemæ with closed cavities, and Pseudolampses, Lacticæ and Aphthonæ with closed cavities.

The character used by Chapuis for the definition of his Amphimelites (the insertion of the antennæ against the inner border of the eye) is open to some objection, as the same is observed in Psylliodes, of which no mention has been made. The latter genus he erroneously places among those with open front coxal cavities.

A striking character, in a few (in our fauna) genera, is the abrupt inflation of the last joint of the hind tarsi. In this case the claws are usually smaller and more slender than on the four front feet, and at times simple, while the others may be broadly appendiculate at base. In the vast majority of our genera the claws are appendiculate, but in the group Aphthonæ they are simple; rarely (*Blepharida*) the claws are bifid.

As a rule the posterior tibia, at least, has a terminal spur, although several genera are mentioned by Chapuis without, these are not represented in our fauna. It is almost as rare to find genera with spurs to all the tibiæ. On this point Chapuis seems to have been confused, as on p. 68 he says of *Cœporis:* "this character is not otherwise known in the entire subtribe," while on p. 11 he instances *Cœporis* and *Xuthea*, and on p. 21 a group is formed on this character alone, Diamphidiites. Among our genera *Blepharida* and *Hemiglyptus* have spurs to all the tibiæ.

A character of no small importance is found in the impressed lines at the base of the thorax. Here Chapuis has been especially vague, and it has been found extremely inconvenient to retain his groups Halticæ and Crepidoderæ as constituted each to contain genera without the least trace of a groove.

The other characters made use of in the following tables seem sufficiently plain without further explanation.

From what has been observed in the study of our genera it is evident that some of Chapuis' groups must be modified as to their composition. *Homophata* should certainly not remain with the Œdionyches nor *Phrynocepha* with Halticæ, and the two have the essential characters of the Aspicelæ. The Monoplati contains in Chapuis thirty-nine genera; one of these (Pachyonychis ‡ *Clk.* = *Hamletia* Cr.) has the anterior coxal cavities open behind, and is a true Œdionychide, and from the fact that in our fauna a genus has occurred which might readily be placed in the group by its facies and with open front coxal cavities, it seems very probable that a second careful examination would show that some of the genera at present placed in Monoplatites should be removed.

The entire tribe is one which presents many difficulties in its study. The characters of taxonomic importance are few, and these are so often interlinked as to make it almost impossible to decide to which priority of importance should be given.

At this point I desire to acknowledge the kind assistance of friends in the preparation of the work.

The Museum of Comparative Zoology at Cambridge contains the types of Melsheimer, Ziegler and LeConte; these I have been permitted to examine carefully during a recent visit to the Museum.

The National Museum at Washington has added vastly to the series examined.

To Messrs. Ulke and Schwarz, of Washington, I am indebted for the loan and gift of much valuable material not elsewhere accessible.

To Messrs. Angell and Roberts, of New York, I owe important data in distribution obtained from a loan of their material.

To Mr. Henshaw, of Boston, and Blanchard, of Lowell, I am indebted for a knowledge of the species of the New England region.

In this city the Wilt collection, now the property of the American Entomological Society, contains the most extensive material examined, although a little less rich in species than the LeConte cabinet.

From Messrs. Wenzel and Liebeck much information of value has been obtained regarding the species of the vicinity of Philadelphia.

My own cabinet needs scarcely more than half a dozen species to make it complete.

From the large material examined I have been enabled to determine the limits of the species from numbers of specimens, and it is *extremely rarely* that I have ventured to indicate species on unique examples, and then only when the characters have been so pronounced as to warrant it.

It may be the cause of surprise to some readers that more mention has not been made of the habits of the species and their food plants, as they are all more or less injurious to vegetation, and the economic literature contains considerable information on this point.

In explanation of this it may be stated that the various collectors are not in agreement as to specific names in their collections, and I have preferred to give only such information as has been supplied with specimens and have not trusted to their economic literature unless confirmed by positive data.

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Analytical Table of Groups of Halticini.

Last joint of hind tarsi globosely inflated.....2.
Last joint of hind tarsi not globosely inflated, usually slender, but sometimes thickened when viewed laterally.....3.
2.—Anterior coxal cavities closed behind, elytra punctate-striate.
II. MONOPLATI.
Anterior coxal cavities open behind.
Elytra punctato-striate; surface pubescent; thorax much narrower than the elytra.....III. PSEUDOLAMPSES.
Elytra with confused punctuation; surface glabrous; thorax very little narrower than the elytra.....IV. ŒDIONYCHES.
3.—Anterior coxal cavities open behind.....4.
Anterior coxal cavities closed behind.....8.
4.—Mesosternum very short, nearly concealed by the approximation of the pro and metasterna; body orbicular or hemispherical.....VII. MNIOPHILÆ.
Mesosternum always visible, usually moderately long.....5.
5.—Prothorax without transverse ante-basal impression.....6.
Prothorax with transverse ante-basal impression.....7.
6.—Posterior tibiæ broadly sulcate on the posterior edge and with a more or less elevated margin each side, obliquely sinuate on the outer margin near the apex; last joint of posterior tarsi thickened.....V. ASPICELÆ.
Posterior tibiæ faintly or not grooved, without sinuation; last joint of hind tarsus slender.
First joint of hind tarsus short as compared with the tibia and rather broad; claws appendiculate; species of moderate or larger size.
VI. DISONYCHÆ.
First joint of hind tarsus slender and long; claws simple; species of small size.....XV. APHTHONÆ.
7.—Transverse impression usually feeble, not limited at each extremity.
VIII. HALTICÆ.
Transverse impression deep, limited at each end by a longitudinal plica.
IX. LACTICÆ.

8.—Antennæ 11-jointed.....9.
Antennæ 10-jointed.....12.
9.—Antennæ distant at base; tarsal claws bifid.....I. BLEPHARIDÆ.
Antennæ approximate at base; claws simple or appendiculate.....10.
10.—Posterior tibiæ sinuate near the apex, the sinuation limited above by a distinct tooth
First two ventral segments connate, the suture, however, distinct; thorax without trace of ante-basal impression.....XIII. CHÆTOCNEMÆ.
First two ventral segments articulated; thorax with ante-basal impressed line.....XII. EUPLECTROSCELES.
Posterior tibiæ without sinuation or tooth.....11.
11.—Thorax with distinct ante-basal transverse impression, usually well limited at its ends; elytra punctato-striate.....X. CREPIDODERÆ.
Thorax without ante-basal *transverse* impression.
Spur of posterior tibia small and slender.
Thorax with a short, but deeply impressed longitudinal line each side; elytra punctato-striate.....XI. ARSIPODES.
Thorax without any impression; elytra with confused punctuation.
XIV. SYSTENÆ.
Spur of posterior tibia broad, emarginate or bifid at apex..XVI. DIBOLIÆ.
12.—Posterior tibia prolonged beyond the insertion of the tarsus, which is placed rather on the outer side above the apex.....XVII. PSYLLIODES.

Group I.—BLEPHARIDÆ.

Antennæ 11-jointed, rather distant at base. Thorax without basal impressions. Anterior coxal cavities closed behind. Last joint of posterior tarsi rather slender, the claws bifid. Form short, robust as in many Chrysomelæ.

This group, as constituted by Chapuis, contains four genera, but one having representation in our fauna. In the generic description which follows certain characters are mentioned which may require a modification of those of the group when the other genera have been studied a little more closely.

BLEPHARIDA Rogers.

Head broadly oval, moderately deeply inserted, front vertical, broad, not carinate, the tubercles flat, widely separated, clypeus truncate. Labrum transverse, arcuate in front; maxillary palpi slender, moderately long, the joints cylindrical, the terminal longer than the third, acute at tip. Antennæ rather widely distant at base, slender, half as long as the body, first four joints glabrous, outer joints opaque and finely pubescent, first joint clavate, second oval, half as long, third and fourth slender, each longer, five to ten broader than fourth and gradually very slightly shorter, eleventh longer, appar-

ently constricted at apex, but actually with a small terminal, articulated joint. Eyes oval, prominent, narrower above. Thorax transverse, narrowed in front, base arcuate, apex feebly emarginate. Elytra a little wider at base than the thorax, oval, widest at middle, surface regularly punctato-striate. Prosternum rather widely separating the coxæ, as elevated as they, dilated at apex, and with the epimera closing the cavities behind. Mesosternum narrowly visible, vertical in front; ventral segments free, the first as long as the next three, these nearly equal, fifth nearly as long as the preceding two. Legs rather short and robust, posterior femora moderately inflated. Tibiæ gradually broader to apex, each with a short terminal spur, anterior tibia not sinuate near apex, middle and posterior tibia with a distinct sinuation bordered with short ciliæ, limited above by a distinct angulation, the posterior deeply grooved on posterior edge at apex; tarsi stout, first joint broadly triangular, second narrower, third broadly bilobed, fourth slender, terminated by bifid claws. Form robust, glabrous, winged (Pl. vii, fig. 18).

The various opinions which have been emitted regarding the position of Blepharida have been dwelt upon in considerable detail by Chapuis (Genera xi, p. 33), and need not be repeated here.

Several points in the organization seem to have been passed over. The antennæ are really 12-jointed (Pl. vii, fig. 18), the terminal piece of the eleventh joint being distinctly articulated and movable. All the tibiæ have a distinct terminal spur, and, in such a large insect, it is remarkable that this should have been passed over.

The male has the first joint of the anterior and middle tarsi more widely dilated than the female. The last ventral segment is sinuate each side, the median lobe transversely impressed near the margin.

But one species is known in our fauna.

B. rhois Forst.—Form short, robust oval, convex, beneath rufotestaceous, above yellowish testaceous, elytra irregularly variegated with rufocastaneous. Antennæ with four basal joints rufotestaceous, the outer joints piceous or nearly black. Head entirely yellow, sparsely coarsely punctate on the vertex. Thorax more than twice as wide as long, narrowed in front, sides regularly arcuate, anterior angles prominent anteriorly, hind angles obtuse, lateral margin thickened, limited within by a row of punctures, disc convex, sparsely finely punctured, a few coarse punctures at the middle of the declivity. Elytra scarcely wider at base than the thorax, humeri broadly rounded, sutural angle rather obtuse, disc convex, with nine feebly impressed striæ; striæ with coarse, deep, but not closely placed punctures, an extremely fine puncture between the larger ones, intervals broad, scarcely convex. Abdomen finely punctate and pubescent. Legs rufotestaceous. Length .20—.26 inch; 5—6.5 mm.

This species is variable in the coloration of the elytra; sometimes these are in great part yellow, with a few scattered, small, rufocastaneous spots, or they may be irrorate with that color, or finally the entire disc may be rufocastaneous with the sides and apex broadly yellow. Those variations as remarked by Mr. W. F. Rogers amply account for the many synonyms.

Occurs from Massachusetts to Montana, and from these points south to Florida and Texas.

Group II.--MONOPLATI.

Antennæ 11-jointed. Prothorax usually narrower at base than the elytra, either with or without ante-basal transverse impression. Anterior coxal cavities closed behind. Last joint of posterior tarsi globosely inflated at tip, the claws appendiculate in our genera.

Two characters neatly define this group, the closure of the anterior coxal cavities and the globosely inflated apex of the last joint of hind tarsi. The first of these characters will be found in many groups, the latter only otherwise in the Œdionyches and Pseudolampses, both of which have the coxal cavities open.

The following genera occur in our fauna:

Maxillary palpi slender; thorax not impressed at base; posterior tibiæ with a double terminal spur ..... **Phædromus.**

Maxillary palpi stout; posterior tibiæ with one spur.

Posterior tibiæ longitudinally bicarinate; thorax transversely impressed at base; body glabrous ..... **Pachyonychus.**

Posterior tibiæ feebly unicarinate; thorax not impressed; body hairy. **Hypolampsis.**

These genera all belong to the Atlantic region.

PHÆDROMUS Clark.

Head short, transverse. Labrum rounded in front; maxillary palpi slender, second joint obconical, third twice as long, slightly broader at tip, fourth very small, more slender, acute at tip. Eyes large, globular. Antennæ filiform, but rather stout, first joint clavate, arcuate, second short, oval, third shorter than first, joints following gradually shorter, the last acuminate. Prothorax transverse, apex squarely truncate, sides angularly dilated in front of middle, disc little convex, subdepressed at base, without ante-basal impressions; scutellum very small. Elytra a little wider than the thorax, sides subparallel, moderately convex, finely punctate. Legs

moderate, posterior thighs oval, tibiæ slightly incurved, slightly thickened, the posterior edge depressed and margined, the edges slightly sinuate toward the apex, without trace of tooth, but forming at apex a double shortened spine. Tarsi with first joint subdilated, second short, third large, orbicular, fourth elongate, swollen, globular, with appendiculate claws.

P. Waterhousei Clark.—Oblong, subdepressed, glabrous, shining. Thorax yellow, impunctate. Elytra oblong, parallel, finely punctato-striate, the striæ nearly obsolete toward apex, color black, shining. Body beneath and antennæ black. Legs pale. Length .25 inch.; 7 mm. nearly.

This insect was described by Clark from a specimen obtained from Mr. George R. Waterhouse, said to be from South Carolina. The specimen in the British Museum carries the label "Carolina."

No specimen has ever been seen in any American collection, and there is consequently a suspicion that the locality given may be erroneous. The above description will enable it to be recognized when seen.

PACHYONYCHUS Chev.

Head broadly oval, not deeply inserted; eyes free, clypeus truncate, front short, very obtusely carinate, the tubercles large, flat, oblique; labrum transverse, entire. Eyes oval, moderately prominent, finely granulated. Maxillary palpi short, very robust, second joint conical, third very short, obconical, fourth as broad at base as the third, closely articulated with it and longer, obtusely oval at tip; these two joints apparently form a flattened ovate club to the second joint. Antennæ a little longer than half the body, not thickened externally, first joint clavate, second and third short, nearly equal in length, together longer than the first, but shorter than the fourth, the latter a little longer than the first; joints 4–10 equal, shorter than the fourth, eleventh longer, constricted at tip. Thorax broader than long, apex truncate, base truncate at middle, obliquely sinuate each side, disc convex, with a deep ante-basal transverse impression. Elytra oblong, emarginate at base, disc punctato-striate. Prosternum moderately separating the coxæ, dilated behind them and with the epimera closing the coxal cavities. Mesosternum moderate in length. Ventral segments free, the first and fifth longer, the intermediate equal. Legs moderate in length. Tibiæ slightly broader toward apex, the posterior broadly sulcate, carinate each side and terminated by a single spur; tarsi moderately long, the first two joints triangu-

lar, the first longer, third broader and bilobed, the fourth on the posterior legs globosely inflated at apex. The claws appendiculate. Form oblong, surface glabrous, body winged.

This genus is now for the first time fully described, although Melsheimer described the species on which it is based in 1847. The question of the validity of Pachyonychus and Pachyonychis has been amply discussed by Crotch (Proc. Acad. 1873, p. 58), and by Jacoby and myself (Trans. Am. Ent. Soc. xv, pp. 302–304), and will not be dwelt upon at this time. At that time the suggestion was made that it might be related to Cerichrestus, which now seems to me not well founded. At present I am unable to suggest any special relationship for it, although by the table given by Chapuis it must be placed near Omototus and Hypolampsis.

One species is known to me.

P. paradoxus Mels.—Oblong, nearly parallel, rufotestaceous, shining, elytra piceous, the margin narrowly, the suture broadly rufotestaceous. Antennæ black, the three basal joints rufotestaceous. Head smooth, shining. Thorax more than one-half broader than long, not narrowed in front, sides feebly arcuate, margin thickened at front angles, posterior angles rather acute, disc convex, irregularly sparsely punctate, the ante-basal impression deep, extending from side to side within the angles. Elytra wider at base than the thorax, humeri obtusely prominent, umbone distinct, base emarginate at middle, sides feebly arcuate, apical angles well defined, disc moderately convex, regularly punctato-striate, striæ not deeply impressed, punctures moderately coarse and closely placed, intervals slightly convex, broader than the striæ, each with a row of very fine punctures. Abdomen sparsely punctate and slightly pubescent. Length .12—.18 inch.; 3—4.5 mm. Pl. vii, fig. 1.

No sexual characters have been observed in the seven specimens before me.

Occurs in the Middle States region; sometimes abundant in District of Columbia (Ulke).

HYPOLAMPSIS Clark.

Head moderately deeply inserted, the eyes free, clypeus somewhat prolonged, truncate, front very obtusely carinate, the tubercles distinct. Eyes oval, convex, coarsely granulated. Labrum transverse, slightly emarginate. Antennæ rather stout, not longer than half the body, the five outer joints rather abruptly broader, forming an elongate club which is opaque, and with dense fine pubescence, first five joints not densely pubescent, shining; first joint clavate, second oblong oval, as stout as first, but shorter, third more slender, longer

than second, 4–5–6 gradually shorter, 7–10 quadrate or more transverse, eleventh longer, oval, obtuse at tip. Maxillary palpi stout, second joint clavate, third ovate, fourth conical, acute and scarcely longer. Thorax quadrate, not narrowed in front, apex truncate, base arcuate, without ante-basal discal impressions. Elytra wider at base than the thorax, oblong oval, widest at middle, surface coarsely and densely striato-punctate, with a more or less distinct oblique impression on each elytron. Prosternum rather narrow between the coxæ, dilated behind them, the cavities rather widely closed behind. Mesosternum distinct, oblique. Abdominal segments free, 2–3–4 equal in length. Legs moderately stout, the posterior femora broadly oval. Anterior and middle tibiæ scarcely wider at tip, the posterior tibiæ with the posterior edge rounded, dilated at tip, a small tooth above the dilatation, the apex distinctly prolonged beyond the insertion of the tarsus and with a small spur. Posterior tarsi nearly as long as the tibia, first joint obconical, very narrow at base, second smaller in front, but more depressed, third elongate oval, not bilobed, fourth nearly as long as the preceding, abruptly inflated at apex, the claws toothed at middle. Claws of anterior and middle tarsi bifid, the inner division shorter and curved inward. Body pubescent and with erect hairs.

The above description is drawn from our species alone. Chapuis remarks that the species are often quite dissimilar, and their study, from a generic standpoint, of some difficulty. Some differences have been observed between his generic description, and that above given for our species, more, however, in the omissions in preceding descriptions to mention especially the form of the hind tibiæ at apex and the form of the claws. As Hamlet Clark, the author of the genus, has seen our species and considered it a true Hypolampsis. I feel unwilling to do more than say that the species seem to need more careful study generically.

Two species are known to me in our fauna:

Thorax roughly punctured, wider than long; elytra not striate.....**pilosa.**
Thorax evenly punctured, as long as wide; elytra broadly striate.....**Mellyi.**

H. pilosa Illig. Oblong oval, convex, opaque, variable in color from testaceous to piceous black; surface with recumbent pubescence and more sparsely placed erect hairs. Antennæ rufotestaceous or brownish, the outer five joints always darker, sometimes black. Head densely punctate and rugose, the tubercles alone smooth. Thorax quadrate, very little wider than long, not narrowed in front, sides straight or slightly sinuous, anterior angles obtuse to the front,

base arcuate, disc convex, very coarsely and closely punctate, surface irregular and with two distinct callosities slightly in front of middle. Elytra wider at base than the thorax, rather broadly emarginate at middle, humeri obtusely prominent, umbone moderately prominent, disc convex, with a faint oblique impression from the humerus to suture, ending in a more or less defined fovea on the first and second striæ, a little in front of middle, the striæ composed of very coarse and deep punctures, closely placed, the intervals not wider than the distance between the punctures very minutely punctulate, the surface not densely clothed with fine recumbent pubescence, usually intermixed with brown and gray, the scutellum whitish, the two foveæ and often two others more posterior black. Body beneath similar in color to the upper surface, shining; the abdomen very sparsely punctate. Legs usually a little paler than the under surface. Length .07—.16 inch; 2—4 mm.

In the male the last ventral segment is truncate, shorter than in the female and more convex.

This species is probably more variable than any other Halticide in our fauna. The size is noted above, and when the small one is pale rufotestaceous and the large one almost black, the contrast is very striking. With the color of the surface the pubescence varies so that the black forms from the Southern States have entirely black pubescence, those from the Middle States with brown color are variegated. In the very small specimens the thoracic callosities are not evident, and there seems to be vague median impression. The oblique impression of the disc of the elytra may be distinct or not, and the punctures round or more crowded and quadrate.

The sufficiently abundant material before me proves the necessity of uniting some of the forms mentioned by Crotch under one name. The species since described by LeConte does not belong to the group.

Occurs from the Hudson's Bay region to Florida, and from Massachusetts to Oregon, a sufficiently wide distribution to admit of great climatic variation.

H. Mellyi Cr.– Elongate, moderately convex, pale brown, feebly shining, sparsely clothed with grayish pubescence and with sparse erect hairs. Antennæ brownish, joints 3 4–5 paler. Head pale brown, front testaceous, occiput closely punctate. Thorax as long as wide, quadrate, anterior angles obliquely truncate, sides slightly coarctate behind the middle, disc moderately convex, a vague transverse depression in front of base, surface densely, but not roughly punctate. Elytra nearly twice as wide at base as the base of the thorax, the disc with rather broad, but not deep striæ, the punctures rather coarse and closely placed, intervals distinctly convex and finely punctulate. Body beneath pale fuscous, the abdomen sparsely punctate and with few hairs. Legs pale yellow. Length .12 inch; 3 mm.

Of this species I have seen but the single specimen in the cabinet of Dr. LeConte. The surface sculpture is less rough than in *pilosa*,

although here the striæ are well marked. It differs especially from that species in having the thorax less roughly punctured, and in shape nearly as long, if not longer than wide.

One specimen, Kansas.

Group III.—PSEUDOLAMPSES.

Antennæ 11-jointed. Thorax much narrower than the elytra. Anterior coxal cavities open behind. Posterior tibiæ not sulcate, apex with small spur. Last joint of posterior tarsus globosely inflated, the claws appendiculate. Body pubescent, elytra punctato-striate.

In this group we have a structure intermediate between the Monoplati and Œdionyches, with a greater resemblance to the former from the pubescent surface and striate elytra as well as the form.

From the discovery of this form it may be questioned whether all the genera now placed in the Monoplati really belong there. Already one genus, Pachyonychis *Clk.*, has been found to be incorrectly placed there, and it seems to me possible that some of those with slender palpi might be placed in this group.

One genus is known to me.

PSEUDOLAMPSIS n. g.

Head broad, rather deeply inserted, eyes free, front not carinate, tubercles small and indistinct, clypeus slightly prolonged, truncate. Labrum arcuate. Eyes oval, prominent, rather coarsely granulated; maxillary palpi slender, second joint slightly thicker toward apex, third much shorter, obconical, fourth more slender, but as long, acute at tip. Antennæ half as long as the body, gradually thicker toward apex, first joint elongate oval, second ovate, half as long as first, third slender, as long as the second, joints 4–10 nearly equal in length, but gradually broader, eleventh longer, the tip broadly conical. Thorax a little wider than long, not narrowed in front, lateral margin entirely obliterated; scutellum small. Elytra nearly twice as wide at base as the thorax, humeri prominent, sides feebly arcuate, very little wider at middle than at base, disc convex, a distinct post-basal impression extending obliquely backward from the suture to the sides, surface punctato-striate. Prosternum moderately separating the coxæ, very slightly dilated at apex, the coxal cavities rather widely open behind. Mesosternum distinct, oblique. Ventral segments free, the first longer, next three equal, fifth longer. Legs

moderate, anterior and middle tibiæ scarcely broader at apex, outer edge rounded. Posterior femora broadly thickened, posterior tibiæ very little broader at apex, the outer edge faintly unicarinate, obliquely truncate at apex, without sinuation or tooth, terminated by a small spur; tarsi moderate in length, first joint slightly broader externally, second equally broad, triangular, fourth deeply bilobed. Last joint of posterior tarsi globosely inflated at apex, claws appendiculate at base. Form short, like a robust *Lema*, body above finely pubescent.

This genus is suggested for a small species described by Dr. LeConte as *Hypolampsis guttata*, but the open anterior coxal cavities not only forbid its retention in that genus, but in the group to which it belongs.

There seems to be a parallel arrangement of groups of genera in which the anterior coxal cavities are either open or closed, each group possessing in turn an added character alike in the two series. The Monoplati have closed cavities, and the inflated fourth tarsal joint. In the present genus we have the open cavities and inflated joint. In the Œdionyches we have open cavities and inflated joint, but the surface is glabrous, elytra confusedly punctate and thorax not much narrower than the elytra. There still remains to be discovered an Œdionychoid genus with closed coxal cavities.

P. guttata Lec.—Form rather robust, piceous, feebly shining, clothed with fine fulvous pubescence, forming an irregular pattern. Antennæ pale yellowish brown. Head reddish yellow, rather coarsely and closely punctate. Thorax quadrate, slightly broader than long, sides feebly arcuate, base arcuate at middle, very slightly oblique each side, disc convex, densely not coarsely punctate; finely pubescent. Elytra nearly twice as wide at base as the thorax, humeri obtusely prominent, umbone moderately prominent, disc convex, a vague oblique impression on each elytron, moderately deeply punctato-striate, the punctures moderately coarse and serrate, intervals convex, scarcely wider than the striæ, extremely finely punctulate; surface with fulvous pubescence forming a broad space at apex, and on the disc a humeral space, an oblique band in the depression and an oval space behind it. Body beneath rufescent, abdomen paler, with close, fine punctuation and pubescence. Legs yellowish testaceous. Length .08 inch.; 2 mm.

In the male the last ventral segment is broadly emarginate at middle.

The form of this insect resembles Hypolampsis somewhat, but more closely some of the short Lema, or even certain of our Xylophilus.

Occurs near New Orleans, Louisiana.

Group IV.—ŒDIONYCHES.

Antennæ 11-jointed, usually slender. Prothorax without trace of ante-basal transverse impression. Anterior coxal cavities open behind. Elytra glabrous and with confused punctuation. Last joint of hind tarsus globosely inflated at apex.

These few words define this group with sufficient sharpness to enable any of its members to be recognized, and it seems to me that the characters should be strictly applied, so that no genus without *globosely* inflated claw joint to the posterior tarsus should be admitted here; consequently, Homophœta has been excluded. Chapuis notes the close resemblance between some Aspicelites and members of the present group without realizing the necessity of a rearrangement of the two groups.

Two genera are known in our fauna separated in the following manner:

First joint of hind tarsus short and broad; four anterior claws feebly appendiculate, the posterior slender and simple..... **Hamletia.**

First joint of hind tarsus moderately long and slender, claws all appendiculate. **Œdionychis.**

The first of these genera was placed by Chapuis in the Monoplati under the name *Pachyonychis.*

HAMLETIA Crotch.

Head not deeply inserted in the thorax, occiput oblique, front vertical, labrum transverse, slightly sinuous at middle. Maxillary palpi stout, the penultimate joint obconical, a little longer than wide at apex, last joint acutely conical. Antennæ 11-jointed, separated at base by an obtuse frontal carina, joints 5–11 equal in width, broader than those which precede, third and fourth joints nearly equal in length. Thorax a little wider at base than long, very feebly emarginate at apex, sides subangulate at middle, base truncate, distinctly sinuate at the hind angles. Elytra distinctly wider at base than the thorax, humeri rounded; anterior coxal cavities open behind, angulate externally, the trochantin visible. Posterior tibiæ rather deeply sulcate on the outer edge and with a distinct sinuation and small tooth above the insertion of the tarsus. First joint of posterior tarsi short and rather stout, the claw joint globosely inflated, the claws slender and simple. First joint of front tarsi broadly triangular, the claws of this and middle tarsi feebly appendiculate.

From the description which Chapuis gives of this insect under the name *Pachyonychis* (Genera xii, p. 100) it is very evident that he has not seen the insect, otherwise it would never have been placed in the Monoplati from the open front coxal cavities. With the limited material in our fauna it is better to place the genus with the Œdionyches, although it might well constitute a tribe intermediate between that and Monoplati. The fact of the dissimilarity of the claws seems to have escaped notice, those of the hind tarsi being absolutely simple and slender, those of the front and middle are slightly appendiculate in the usual manner. This fact is sufficient to indicate the tribe, together with the dissimilarity in the form of body from any of the Œdionyches, approaching somewhat certain Monoplati as Tetragonotes.

The reasons for adopting this name for the genus have been fully given by Mr. Jacoby, who has also shown the incorrect position of the genus by Chapuis (Trans. Am. Ent. Soc. 1888, p. 302).

H. dimidiaticornis Crotch.—Elongate oval, subdepressed, feebly shining, beneath almost entirely piceous, legs yellow, above black, elytra blue-green Antennæ a little longer than half the body, the three basal and half the fourth, also the three terminal joints pale, the intermediate piceous. Head black, smooth, frontal tubercles distinct and with a transverse depression above them. Thorax a little wider at base than long, narrower in front, apex scarcely emarginate, sides obtusely angulate at middle, the margin very narrow, front angles not dentiform, base sinuate each side, the hind angles moderately prominent, surface black, shining, not punctate. Elytra wider at base than the thorax, humeri rounded, umbone distinct, limited within by a slight depression, surface bluish green, relatively coarsely and closely punctate, but much smoother near the apex. Body beneath black. Abdomen piceous, the last segment yellow. Legs pale yellow. Length .13 inch.; 3.25 mm. Plate VI, fig. 9.

The specimen before me is a male, and has the last segment subtruncate and with a slight impression at middle, in length the segment nearly equals the two preceding, and in the female is probably longer.

This insect seems to be one of the rarest of our Halticides. I have seen but three specimens,—one in my cabinet and that of LeConte, from Georgia, the third in the British Museum from an unknown locality. As the latter came from the Dejean collection it is probably also from Georgia.

ŒDIONYCHIS Latr.

Head inserted in the prothorax to the posterior border of the eyes front variable, either regularly declivous from the occiput with mouth more anterior, or abruptly vertical from the insertion of the antennæ so that the mouth is more inferior, the carina usually obtuse, the tubercles usually feebly developed. Antennæ approximate at base, slender. Thorax always much broader than long, deeply emarginate in front, the margin more or less dilated, often widely, the front angles dentiform or not, base arcuate, more or less obliquely sinuate near the posterior angles. Elytra oval, the margin often explanate the humeri not prominent. Prosternum not depressed between the coxæ, moderately wide between them, dilated behind, the cavities open behind, angulate externally, exposing the trochantin. Metathoracic parapleuræ rather wide, parallel and always more roughly sculptured than the adjacent part of the sternum. Legs short and robust, the anterior and middle femora fusiform, the tibiæ slightly broader at apex, the outer edge deeply grooved, ciliate along the edges; tarsi with first joint oblong, triangular, second smaller and narrower, third subbilobed, fourth with the claws divaricate and appendiculate at base. Posterior femora very stout and thick, sometimes nearly as wide as long, deeply grooved beneath for the tibiæ these short feebly grooved on the posterior edge, which has a sinuation just above the insertion of the tarsi and limited above by a small acute tooth; a single slightly curved spur at the tip of the tibia. Tarsi more slender than in front, the claw joint globularly swollen, the claws small and appendiculate. Plate VII, fig. 11.

In a study of the comparatively small number of species two forms of head were observed with other characters in association. As a rule, the outline of the head when viewed laterally forms a regular curve from the occiput to the mouth. In our smaller and more depressed species, the front below the insertion of the antennæ is nearly vertical, so that the mouth is somewhat retracted and opens inferiorly, while in the larger species the mouth is anterior. When the front is regularly arcuate, the antennæ are somewhat stouter and rarely reach the middle of the body, the front between the eyes has not the deep transverse groove, while the tubercles are rather more distinct. In those with the vertical front the antennæ are slender and usually longer than half the body, the interocular groove is deep, while the tubercles are not distinct. The species of the first series are larger and convex, those of the second smaller and more depressed.

The oblique sinuation of the base of the thorax although fairly well marked in the majority of the species is very variable, and in many of the species of the second series not at all evident. The extent of the expansion of the lateral margins of both thorax and elytra is purely a specific matter, and will be referred to in the descriptions.

The epipleuræ show two fairly distinct forms. In those species which have no expansion of the margin of the elytra, the epipleuræ are always very narrow at apical half, while in those with explanate elytra the epipleuræ are broad until very near the apex.

The sexual characters (if they have not escaped observation) have never been referred to in print. The first joint of the anterior tarsus is always more broadly dilated in the male; the last ventral segment has on each side a deep sinuation, the space between forming a prominent oval lobe which has a finely impressed line at middle. The last ventral of the female is entirely simple. Among the different males no part in analysis can be taken from the sexual differences as the variation is too slight.

In one species (*tenuilineata*) it will be observed that the male is shorter, the thorax scarcely wider at base than at middle, while in the female the form of thorax is that usual in the genus. In *miniata* also the males are shorter and more convex than the females. As far as my observation goes the females are fully four times as numerous as the males.

As *Œdionychis* is so well known and abundantly represented by species, it will be used as the centre of comparison for allied genera. Attention is directed, however, to the fact that about the only character separating *Physodactyla* is in the present genus purely sexual, that is, all male *Œdionychis* would be *Physodactyla*.

The species with a single exception belong to the Atlantic region, several reaching Arizona; *violascens* is the only one at present known from the Pacific slope.

Based on the notes always given it is proposed to divide our species into two series in the following manner:

Antennæ stout, scarcely as long as half the body; species larger and convex; front oblique, interocular impression never very distinct, usually obliterated by punctures; thorax rarely widely margined; elytra never explanate ..... SERIES A.

Antennæ slender, as long as, or longer than half the body; species small, much depressed, front vertical, a deep, transverse, interocular depression; elytra usually explanate ..... SERIES B.

Series A.

Elytra *entirely* unicolorous, either bright metallic blue, dull violaceous, or nearly black, margin never pale.. ..... 2.

Elytra bicolored, either with a pale margin or with the disc vittate (in *fimbriata* sometimes entirely pale) ..... 6.

2.—Body never entirely black beneath..... 3.

Body and legs entirely black..... 5.

3.—Elytra brilliant blue or green, thorax smooth, body beneath entirely pale. 1. **gibbitarsa.**

Elytra dull violaceous or greenish black, thorax more or less punctate, body beneath in greater part dark..... 4.

4.—Elytral punctures distinct, often coarse and close; thorax at least bordered with pale ..... 4. **vians.**

Elytral punctures obsolete, thorax black ..... 5. **concinna.**

5.—Surface rather shining, punctures very distinct..... 6. **violacens.**

Surface dull black, impunctate..... 7. **lugens.**

6.—Elytra violaceous or bluish, margin pale.

Thorax and elytra coarsely and closely punctate..... 3. **thoracica.**

Thorax and elytra indistinctly punctate, elytra brilliant violaceous. 2. **flavocyanea.**

Elytra distinctly punctured, a short yellow vitta just within the humeral umbone..... var. **brevilineata.**

Elytra entirely testaceous, vittate or maculate.

Elytra entirely testaceous..... fimbriata var.

Elytra blue, green or violaceous, disc with a yellow vitta, usually in form of **!**; sometimes entire..... 8. **interjectionis.**

Elytra yellow, with dark vittæ..... 7.

Elytra brown, with large pale spots..... 17. **Jacobiana.**

7.—Three vittæ on each elytron, sutural median and submarginal..... 8.

Two vittæ, sutural and median..... 9.

8.—Form oblong oval, anterior angles of thorax not dentiform.

Body beneath and legs black, elytral punctuation very indistinct, the vittæ blue.. ..... 10. **æmula.**

Body beneath (except metasternum) and legs pale; elytral punctuation distinct and moderately close, vittæ piceous..... 9. **fimbriata.**

Form oval, anterior angles of thorax dentiform.

Elytral vittæ broad, antennæ piceous..... 11. **petaurista.**

Elytral vittæ very narrow, the three basal and the terminal joint of antennæ pale ..... 12. **tenuilineata.**

9.—Elongate oblong; elytra, especially posteriorly, asperate punctate. 16. **longula.**

Oval, or oblong oval, elytra impresso-punctate..... 10.

10.—Antennæ with fourth joint distinctly longer than third..... 13. **miniata.**

Antennæ with joints 3 and 4 equal.

Elytra coarsely and closely punctate..... 14. **Horni.**

Elytra sparsely, finely and indistinctly punctate..... 15. **Ulkei.**

1. **C. gibbitarsa** Say.—Oval, slightly oblong, moderately convex, honey-yellow, elytra brilliant cobalt-blue or green, thorax with four piceous spots, often more or less confluent, tibiæ and tarsi piceous. Antennæ scarcely half as long as the body, piceous. Frontal carina very flat, two feeble tubercles, not transversely impressed between the eyes, a few punctures in a transverse row, others near the eye, vertex and occiput smooth. Thorax more than twice as wide as long, gradually arcuately narrowed from base to apex, margin moderately explanate, but not translucent, surface smooth, with four piceous spots, the middle pair larger, more or less confluent; scutellum black. Elytra slightly wider at base than the thorax, humeri obtuse, umbone moderately prominent, smooth, surface sparsely indistinctly punctulate, epipleuræ concolorous. Abdomen shining, sparsely punctate with very sparse short hairs. Length .18—.28 inch.; 4.5—7 mm.

This species shows no great variation; sometimes the thoracic spots are confluent in a broad transverse band. The elytral variation from blue to green is usual in that color, and it has been observed that the more northern specimens are the more green.

Occurs from the Middle States to Missouri and Texas.

2. **C. flavocyanea** Crotch.—Form rather broadly oval, subdepressed, shining, bright yellow, thorax with a discal spot, elytra violet-blue, the entire margin pale. Antennæ half as long as the body, third and fourth joints about equal, piceous, three basal joints testaceous, terminal joint usually paler than those which precede. Head reddish yellow, frontal carina tuberculiform, the tubercles distinct, vertex coarsely, closely and deeply punctured, especially near the eyes. Thorax more than twice as wide as long, sides arcuately narrowing to the front, the margin moderately wide, especially in front, not translucent, base nearly regularly arcuate, the usual sinuation near the angles scarcely evident, surface sparsely, but very distinctly punctate, color yellow, with a median piceous spot, sometimes forming a very broad transverse band. Elytra not wider at base than the thorax, humeri obliterated, umbone scarcely prominent, disc indistinctly sparsely punctate near base, almost smooth at middle, a region of coarse punctures beginning at the base just within the umbone, extending one-fourth the length of the elytra; epipleuræ yellow, the inner half piceous at the dilated basal portion. Body beneath entirely yellow, abdomen shining, very indistinctly sparsely punctate. Legs yellow, the anterior and middle pair slightly darker. Length .20—.24 inch.; 5—6 mm.

This species has much the form and general coloration of *gibbitarsa*, but may be distinguished by the entirely pale lateral border of the elytra. The discal black spot of the thorax does not seem to be made up of the union of many, but is unique.

Occurs in Texas.

3. **C. thoracica** Fab.—Oblong oval, feebly convex, reddish yellow, elytra piceous with blue, violaceous or slightly greenish lustre, the sides narrowly margined at basal half with pale. Antennæ half as long as the body, piceous; third and fourth joints equal. Head pale, occiput bordered with piceous, frontal carina obtuse, tubercles distinct, surface rather coarsely and closely punctate,

except at the middle of the occiput. Thorax rather more than twice as wide as long, arcuately narrowing to the front, margin narrow, disc rather coarsely, not densely punctate, color reddish, with piceous spots, two in the anterior row, four in a posterior arcuate row; these are usually more or less confluent or forming a zigzag band. Elytra a little wider at base than the thorax, humeri rounded, umbone distinct, smooth, surface closely and moderately coarsely punctate. Epipleuræ pale nearly their entire length. Body beneath and legs reddish yellow, the tibiæ and tarsi piceous. Abdomen shining, indistinctly sparsely punctate. Length .20—.26 inch; 5—6.5 mm.

The sculpture of the upper surface resembles the most coarsely punctate forms of *vians*, which it also resembles in general appearance. The under surface is always entirely reddish yellow. There is very little variation, except in surface color of the elytra and the greater or less confluence of the thoracic spots.

Widely distributed over the entire region east of the Rocky Mountains.

4. **C. vians** Illig.—Oblong oval, moderately convex, very shining. Antennæ black, scarcely as long as half the body, third joint longer than fourth. Head black, sometimes with a pale vertical spot, frontal carina obtuse, tubercles distinct, vertex rather closely punctate. Thorax twice as wide at base as long, narrowed in front, sides nearly straight, margin narrow, surface distinctly punctate, either rather coarsely or moderately finely, color usually yellowish with five piceous spots confluent and forming the letter M or extending into a large discal spot, so that only the margins are narrowly pale; scutellum black. Elytra a little wider at base than the thorax, humeri distinct, umbone moderately prominent, smooth, surface usually closely punctate, although variable in distinctness, color black, with a slight violet lustre. Epipleuræ concolorous; prothorax beneath yellow, meso- and metasternum black. Abdomen piceous at middle, broadly yellow at sides and apex, surface shining, very sparsely punctate. Legs entirely black. Length .16—.28 inch; 4—7 mm.

This species varies in the color of the thorax, as stated above, those with the large discal space being the typical *vians*, while those with the M shaped mark are *scripticollis* Say. The sculpture of the surface may be rather fine or moderately coarse. The abdomen also varies in the extent of the yellow color, sometimes only the middle of the first two segments is piceous.

Occurs nearly everywhere east of the Rocky Mountains

5. **C. concinna** Fab.—Oblong oval, moderately convex, feebly shining, black, elytra slightly greenish or blue, abdomen yellow at apex. Antennæ black, not half as long as the body, third joint longer than fourth. Head black, frontal carina indistinct, tubercles well marked, a distinct concavity of the vertex, which is coarsely closely punctate. Thorax twice as wide at base as long, narrowed in front, sides straight or feebly arcuate, the margin moderate, surface

alutaceous, sparsely moderately punctate; scutellum black. Elytra a little wider at base than the thorax, humeri very obtuse, umbone feebly prominent, surface distinctly alutaceous, punctuation very indistinct, visible near base only. Epipleuræ black. Body beneath black. Abdomen at apex, and often at sides, yellow; the surface shining, very sparsely punctate. Legs entirely black. Length .24—.30 inch.; 6—7.5 mm.

This species resembles *vians*, but is always more elongate, and the elytra are almost entirely without the punctuation so evident even in the smoothest forms of that species. The thorax is here always completely black, both above and beneath and never so in *vians*. The species seems to me abundantly distinct, although Crotch suppressed the older name in making *concinna* a synonym of *vians*.

Occurs in Georgia and Texas.

6. **E. violascens** Lec.—Form rather broadly oval and less convex, violaceous blue, feebly shining. Antennæ short and stout, nearly black, third and fourth joints equal. Head cribrately punctate at sides, smoother at middle of occiput, tubercles obliterated, frontal carina very indistinct. Thorax twice as wide at base as long, distinctly narrowed in front, sides feebly arcuate, front angles slightly everted, disc moderately convex, surface shining, punctures sparse, not deep, a little closer along the base and hind angles, these rather acute. Elytra scarcely wider at base than the thorax, oval, broadest behind the middle, surface coarsely and closely punctate as in the rougher forms of *thoracica*. Body beneath more shining than above, abdomen very sparsely and indistinctly punctate. Length .24 inch.; 6 mm.

This species is rather more broadly oval than several in this part of the series. The color is very nearly that of *thoracica*, and the elytral sculpture rather coarser and deeper. The legs are entirely blue-black.

A specimen in my cabinet, from Nevada, which may be a variety of the above, is slightly bronzed and with less pronounced sculpture.

Two specimens from Fort Tejon, Cala.

7. **E. lugens** Lec.—Oblong oval, feebly convex, dull black, opaque. Antennæ shorter than half the body, third and fourth joints equal. Head coarsely and deeply punctured, densely between the eyes, frontal carina very short and obtuse, tubercles very flat and indistinct. Thorax twice as wide as long, sides arcuately narrowing to the front, margin very narrow, surface moderately closely punctate, more coarsely near the sides Elytra a little wider at base than the thorax, humeri obtuse, umbone not distinct, surface opaque, very minutely alutaceous, without trace of punctuation. Body beneath and legs entirely black. Abdomen shining, the punctuation coarse, but obsolete. Length .18—.22 inch. 4.5—5.5 mm.

The opaque and totally black surface will enable this species to be readily recognized. It is even more elongate and depressed than *concinna*.

Occurs in New Mexico and Arizona.

8. **Œ. interjectionis** Crotch.—Elongate oval, moderately convex, shining. Antennæ brown, half the length of body, third joint a little longer than fourth. Head bicolored, front yellow, occiput piceous, frontal carina indistinct, tubercles feeble, vertex coarsely punctured between the eyes. Thorax twice as wide as long, feebly, arcuately narrowed to the front, lateral margin distinct, color pale yellow, surface smooth, shining. Elytra a little wider at base than the thorax, humeri rounded, umbone distinct, disc finely punctate, smoother near apex, piceous with blue or green lustre, margin narrowly yellow, disc with an interrupted vitta near the suture in a general form like an exclamation mark (!). Epipleuræ pale, the inner half near the base piceous. Body beneath reddish yellow, the metasternum posteriorly piceous Anterior and middle legs and posterior tibiæ brownish. Abdomen shining, very sparsely punctate. Length .23—.25 inch.; 6—6.5 mm. Plate V, fig. 6.

This species is very constant. I have one specimen in which the anterior portion of the vitta is indistinct. The specimen described by Crotch was plainly immature, as it shows none of the metallic surface of all the other specimens examined.

Œ. gracilis Jacoby (Biol. Cent. Am. vi, i, p. 420, pl. xxiv, fig. 14), is merely a variety of this species with the subsutural white vitta entire. According to Mr. Jacoby the elytra may be entirely blue-green, without vitta.

Occurs in Texas (Waco, Belfrage) and Mexico.

9. **Œ. fimbriata** Illig.—Oblong oval, moderately convex, feebly shining, yellowish white, thorax maculate, elytra vittate or not. Antennæ half as long as the body, piceous, scape often paler, third joint a little longer than fourth. Head variable in color, coarsely and closely punctate between the eyes, frontal carina obtuse, tubercles distinct. Thorax more than twice as wide as long, feebly arcuately narrowed to front, margin narrow, front angles not dentiform, disc finely alutaceous, moderately coarsely punctate, color yellowish with five piceous spots usually more or less confluent; scutellum black. Elytra scarcely wider than the thorax, humeri rounded, umbone not prominent, surface closely punctate, more finely at apex, color either entirely yellow or with the three piceous vittæ, sutural, median and marginal, with intergrades. Epipleuræ variable. Body beneath entirely pale, except the sides and posterior portion of metasternum, which are brown or piceous. Abdomen shining, sparsely punctate, distinctly pubescent. Legs yellow, tibiæ and tarsi piceous. Length .20—.30 inch.; 5—7.5 mm. Plate V, fig. 8.

This species presents two ultimate varieties, the vittate and the entirely pale. In the vittate form the stripes are never sharply defined, the median especially shading off indefinitely, while the sutural and lateral are often more like stains than vittæ.

In the typical or vittate form the head is partly black, the front being nearly always pale. The sutural vitta is extremely narrow, the median broad, but variable in width, sometimes not wider than the yellow on each side, or so wide that the yellow is nearly linear. The marginal vitta is also very narrow, and is at the extreme edge of the elytra, the epipleuræ are therefore black at apical half and pale at base.

The pale variety has an entirely pale head. The elytra are entirely yellow, except an extremely narrow sutural stripe. This form resembles, at first sight, similar variations which occur in *Disonycha quinquelineata*.

Occurs from North Carolina to Florida and Texas.

10. **Œ. æmula** n. sp.—Oblong oval, moderately convex, feebly shining, beneath black, above yellow, thorax maculate, elytra each with three vittæ with bluish green surface lustre. Antennæ piceous, not as long as half the body, third joint longer than the fourth. Head black, frontal spot yellow, coarsely and deeply punctured, frontal carina obtuse, the tubercles indistinct. Thorax more than twice as wide as long, sides arcuately narrowing to the front, margin narrow, disc somewhat irregular, sparsely obsoletely punctate, color yellow, with five piceous spots more or less confluent in the form of M. Elytra a little wider at base than the thorax, humeri rounded, umbone not prominent, surface indistinctly alutaceous, sparsely, very indistinctly punctate, color yellow, with the sutural, median and submarginal vittæ piceous with blue-green lustre, the submarginal not reaching the humerus. Epipleuræ pale, the inner border piceous. Prothorax beneath yellow, body black, abdomen black, the last segment yellow, the surface shining, coarsely sparsely punctate. Legs entirely black. Length .18—.22 inch.; 4.5–5.5 mm. Plate V, fig. 7.

This insect so resembles a Disonycha of the *caroliniana* series that on first impression it would be placed among them. Its facies will enable it to be at once known, together with the fact that in no other vittate species are the legs and underside black. It varies in having the median vitta narrower.

Occurs in Arizona, special region unknown.

11. **Œ. petaurista** Fab.—Oval, sometimes slightly oblong, convex, shining, above yellow, thorax with a variable central spot, elytra each with three black vittæ. Antennæ half as long as the body, piceous, the basal joints usually paler. Head reddish brown, cribrately punctate, a moderately deep longitudinal and feebler transverse groove, frontal carina short, tuberculiform, tubercles distinct, but flat. Thorax more than twice as wide as long, sides arcuately narrowing to the front, margin moderately wide, anterior angles dentiform, disc sparsely punctate, yellow, a central spot, piceous, of variable size and form; scutellum black. Elytra scarcely wider at base than the thorax, humeri rounded, surface always distinctly punctate, but variable in degree, color yellowish, with three piceous vittæ, sutural, median and submarginal. Epipleuræ testaceous, the inner edge

at basal half piceous. Body beneath and legs reddish yellow, the anterior and middle tibiæ and tarsi brownish. Abdomen shining, very sparsely punctate. Length .22—.34 inch.; 5.5—8.5 mm. Plate V, figs. 1—5.

This is the largest species in our fauna, and one of the most variable. The variations are in form, sculpture and coloration.

The usual form of this species is oval, usually rather broadly, but occasionally oblong. The elytral sculpture may be as coarse and dense as in *thoracica*, or comparatively smooth. The median vitta is usually equal in width to the yellow on either side of it, but may become broader, and specimens have been seen in which the sutural and median vittæ are confluent. A specimen in my cabinet from Georgia has the submarginal vitta extremely narrow, while another from Florida has the median vitta slender and broadly interrupted at middle. The discal spot of the thorax is variable, but never large, and does not often form a transverse band.

A remarkable variety has been observed, which, for convenience, I call *brevilineata* (Plate V, fig. 4), in which, with an entirely pale margin, the disc is black or slightly bluish, with a short yellow vitta beginning within the humeral umbone. Another variety in the cabinet of Mr. H. A. Kelley has the median vitta almost entirely obliterated.

The intrahumeral impression at the base of the elytra is usually feeble, and the punctures in the vicinity not more conspicuous. Two specimens in my cabinet have the depression deep, and from it proceed coarse punctures extending at least one-fourth the length of the elytra. These also agree in having the submarginal vitta very narrow. It is quite possible that this vitta may disappear, in which case the specimens would agree very well with Harold's description of *Horni*.

Occurs from North Carolina to Texas.

12. **E. tenuilineata** n. sp.—Broadly oval, moderately convex, shining, reddish yellow beneath, pale above, elytra with very slender vittæ, sutural, median and marginal. Antennæ scarcely half as long as the body, piceous, the three basal joints paler, terminal joint partly ♂, or entirely yellow ♀. Head reddish yellow, smooth at middle, coarsely cribrate at the sides, frontal carina very short and obtuse, tubercles distinct. Thorax more than twice as wide as long, widest at base ♀, or not wider at base than middle ♂, sides arcuate, margin rather widely explanate, anterior angles distinctly dentiform, surface smooth, shining, with scarcely any evidence of punctures, color pale yellow with faint traces of five darker spots. Elytra scarcely wider than the thorax, the humeri obtuse, umbone scarcely prominent, a slight impression within it, disc moderately coarsely, not closely punctate near the base, gradually more finely to apex,

the coarsest punctures are close to the margin and extend around the apex; color pale yellow, sutural vitta narrow, entire, median vitta very narrow, submarginal also narrow, curving at base around the umbone, nearly joining the median. Epipleuræ pale, narrowly piceous within. Body beneath and legs reddish yellow. Abdomen shining, sparsely punctate, more coarsely at the sides. Length .25—.28 inch.; 6.5—7 mm. Pl. V, fig. 14.

This species is remarkable in the very slender elytral vittæ, being in this genus the analogue of *tenuicornis* in Disonycha. The thoracic margin is more widely explanate than usual in this series. The male is shorter and broader, the thorax at base not wider than at middle. In the female the terminal joint of the antennæ is entirely pale, in the male only the apex of the joint.

Occurs in southern Arizona (Morrison).

13. **Œ. miniata** Fab.—Oval, convex, sometimes slightly oblong, moderately shining, ferruginous beneath, yellow above, thorax with a brown fascia, elytra with a sutural and median vitta. Antennæ not as long as half the body, piceous, three basal joints paler, third joint a little shorter than the fourth. Head ferruginous, carina tuberculiform, the tubercles distinct, vertex and occiput coarsely punctured, closely near the eyes. Thorax three times as wide as long, sides arcuately narrowed to the front, lateral margin moderately explanate, front angles dentiform, disc sparsely punctate, yellow, a brownish central space usually forming a broad fascia; scutellum black. Elytra scarcely wider at base than the thorax, humeri rounded, umbone distinct, smooth, surface variably punctate, either moderately coarse and dense, or fine and indistinct, with all intergrades; color yellow, with the sutural black vitta entire, a median vitta beginning at the umbone and nearly reaching the tip. Epipleuræ pale, narrowly piceous within. Body beneath and legs reddish brown, the anterior and middle tibiæ and tarsi darker. Abdomen shining, coarsely sparsely punctate and with few hairs. Length .20—.25 inch.; 5—6.5 mm. Plate V, fig. 13.

This species shows the same style of variation as in *petauristæ*. As a rule the males are less frequent than the females, and their form shorter and more convex than the other sex. The punctuation varies in degree, some few being quite as in *vians* (var. *scripticollis*), although less dense, while in others the punctuation is more sparse, less distinct, and near the apex quite obliterated. The median vitta is usually as wide as the yellow space next the suture, but in others either broader or narrower.

After a study of the material before me I am satisfied that *jocosa* Harold is founded on a male of this species. The thorax is apparently less than three times as wide as long and scarcely punctate, but in the series before me from all parts of our country, numbering thirty-six, I can find no reason for recognizing the form as distinct.

Occurs everywhere east of the Mississippi and in Texas.

14. **E. Horni** Harold.—Oval, moderately shining, head ferruginous, thorax and elytra testaceous, the former with a piceorufous fascia, the latter densely and coarsely punctured, sutural vitta rather wide, vitta broad and apparently closely to the lateral margin, beneath piceous, legs rufopiceous. Length 6 mm.

Of somewhat broadly oval form, moderately convex, not feebly shining from the dense punctuation. Head rusty red, front in the middle smooth, around coarsely punctured. Thorax moderately coarsely punctate, more finely at middle, the front angles dentiform; color reddish yellow, with a transverse reddish brown fascia; scutellum black, shining. Elytra densely, equally and moderately coarsely punctured; umbone not prominent; color yellow, a broad sutural vitta gradually narrower posteriorly and a second equally broad, which approaches closely to the lateral border, the yellow space between these vittæ equally broad from base to apex, but narrower than the lateral black vitta; underside brownish black, legs reddish brown, also prosternum. Antennæ dark brown, basal joints scarcely paler, joints 3 and 4 usually long. Epipleuræ yellow, brown within.

Baron Harold compares this with *miniata*, and says that the most nearly approaching specimen of that is much more finely punctured. I have not seen any specimens which I can safely refer to this.

Occurs in Texas.

15. **E. Ulkei** n. sp.—Rather broadly oval, convex, moderately shining, beneath pale reddish brown, above yellow, thorax with a broad pale brown band, elytra with the sutural and a rather broad median brown vitta. Antennæ half as long as the body, piceous, three basal joints paler, third and fourth joints equal in length. Head brownish, coarsely punctured between the eyes, occiput smooth, frontal carina tuberculiform, tubercles distinct. Thorax three times as wide as long, sides arcuately narrowed to the front, lateral margin rather narrow, anterior angles distinctly dentiform, surface alutaceous, distinctly, but sparsely punctate, color yellow, with a broad brownish median fascia; scutellum piceous. Elytra a little wider at base than the thorax, humeri distinct, but obtuse, umbone moderately prominent and smooth, surface moderately finely, not closely punctate, smoother near the apex; color yellow, with a brown sutural vitta, broader at base, median vitta broad, the outer edge parallel with the lateral margin, the inner arcuate, the vitta becoming gradually wider from base beyond the middle, then rapidly narrower to apex. Epipleuræ pale, narrowly piceous within. Abdomen shining, moderately coarsely and closely punctate. Length .18—.20 inch.; 4.5—5 mm. Pl. V. fig. 15.

This species is the smallest in the present series. At first glance it resembles small specimens of *Calligrapha elegans*. It is allied to *miniata*, but is smaller, with a smoother head and differing in the proportion of the third and fourth joints of the antennæ; here these joints are equal in length, in *miniata* the fourth is very plainly longer.

E. Horni Har. is also related, but is described as having the median fascia close to the margin and the elytra densely punctured.

Occurs in Florida. I am indebted to Mr. H. Ulke for the specimen in my cabinet.

16. **Œ. longula** Harold.—Elongate oblong, ferruginous, thorax yellow, obsoletely punctate, with a ferruginous band; elytral humeri not sulcate within, roughly rather densely punctate, suture and discoidal vitta ferruginous brown. Epipleuræ yellow, ferruginous within; antennæ brownish, three basal joints paler, third joint distinctly shorter than the fourth. Length 6.5 mm.

Baron Harold compares this species with *umbratica*, which is much larger. I have not seen anything in any of our cabinets which can be identified with this species, although I suspect it may be a *petauristа* of the more elongate forms in which the submarginal vitta has been lost. A specimen of that species is now before me with the submarginal vitta so narrow that it would readily escape notice. The comparison with *umbratica* adds a little to the probability of the correctness of my surmise.

Occurs, according to Harold, in California. This seems to me very doubtful.

17. **Œ. Jacobiana** n. sp.—Oval, slightly oblong, surface shining, beneath entirely pale reddish yellow, thorax yellowish, immaculate, elytra pale brown, with large yellow spots. Antennæ not reaching the middle of the body, piceous, the three basal joints and half the fourth pale, the terminal also yellow. Occiput piceous, front pale, frontal carina moderately prominent, tubercles distinct, a well marked impressed line between the eyes, a few coarse punctures on each side near the eyes. Thorax more than twice as wide as long, narrowed in front, base scarcely wider than middle, margin rather broad, reticulate when viewed with transmitted light, anterior angles dentiform, surface almost absolutely smooth, yellow, immaculate; scutellum piceous. Elytra a little wider at base than the thorax, humeri obtuse, umbone moderately prominent, smooth, limited within by a rather deep impression, lateral margin narrowly explanate, surface shining, sparsely rather finely punctate near base, smooth at apex, color pale brown with large yellow spots, the first basal of irregular outline, leaving the umbone brown, behind this two smaller oval spots, followed by a broad sinuous fascia interrupted by the suture, near the apex a spot of semi-oval form. Abdomen shining, sparsely, obsoletely, coarsely punctate. Legs entirely reddish yellow. Length .25 inch.; 6.5 mm. Plate V, fig. 16.

Of this species I have seen but one male. The thorax is similar in form to that of the male of *tenuilineata*, and it is probable that in the other sex the thorax is widest at base. It is remarkable that in the two species with this form of thorax in the male the terminal joint of the antennæ should be pale. The latter character, together with the style of elytral ornamentation, will render this species easily known.

Occurs in southern Arizona.

Series B.

Elytra without explanate margin, the epipleuræ very narrow and vertical posteriorly.....2.

Elytra with explanate margin, the epipleuræ wide and horizontal.....4.

2.—Elytra blue, head and thorax dull red, form oblong .....19. **indigoptera.**

Elytra never blue.....3.

3.—Form oblong.

Body above and beneath cream-yellow, surface smooth and shining.

18. **flavida.**

Elytra yellowish, with a narrowly oval sutural space with irregular margins, and which sometimes divides into vittæ.....20. **texana.**

Form oval.

Elytra yellow, with on oval discal black space, with regular borders, and which never reaches the tips of suture; head always yellow.

21. **thyamoides.**

4.—Elytra broadly oval, sides much arcuate, coarsely punctate, entirely dirty yellow, with indistinct vittæ, or with the disc entirely black, margin only pale.....22. **limbalis.**

Elytra with sides feebly arcuate, or nearly parallel; the surface yellow, with piceous or brown spots, or bands, or with the disc entirely piceous .....5.

5.—Thorax very coarsely punctured; elytra with a more or less evident costa from the humeri to apex.....23. **sexmaculata.**

Thorax finely sparsely punctate, or smooth .....6.

6.—Head coarsely closely punctate.....24. **suturalis.**

Head sparsely punctate, or almost smooth.....7.

7.—Smaller species, usually with the elytra in great part piceous.

25. **quercata.**

Larger, elytra yellow, ornamented with black spots tending to form transverse bands.....26. **scalaris.**

18. **Œ. flavida** n. sp.—Oblong, depressed, scarcely at all oval, shining, beneath reddish yellow, above yellowish white. Antennæ slender, a little longer than half the body, testaceous, slightly darker externally, third joint very little shorter than the fourth. Head entirely smooth, a deep transverse impression between the eyes. Thorax two and a half times as wide as long, very little wider at base, sides arcuate, margin explanate and anteriorly reflexed, front angles not dentiform, disc polished. Elytra oblong, sides scarcely arcuate, humeri obtuse, margin not explanate, umbone not prominent, surface smooth, with scarcely any trace of even fine punctures. Abdomen smooth, impunctate. Length .18—.22 inch.; 4.5—5.5 mm.

There is no species known to me in our fauna so completely deprived of surface sculpture as this one. This, with the oblong form and ivory-yellow color, will enable the species to be at once known.

Occurs at El Paso, Texas (G. W. Dunn).

19. **Œ. indigoptera** Lec.—Oblong oval, subdepressed, reddish brown, feebly shining, elytra entirely blue. Antennæ slender, longer than half the body, rufescent, darker externally, third and fourth joints equal. Head sparsely

punctate, a moderate interocular depression. Thorax not twice as wide as long, arcuately narrower to apex, margin moderately explanate, the front angle dentiform, surface distinctly alutaceous, sparsely, finely punctate. Elytra oval, slightly oblong, humeri obtuse, margin not explanate, umbone not prominent, disc moderately coarsely and closely, not deeply, punctate, surface alutaceous, entirely blue or bluish green. Epipleuræ piceous, narrow at apical half. Abdomen shining, sparsely punctate. Length .12—.16 inch.; 3—4 mm.

Similar in form to *thyamoides*, but differs in color. The sinuation of the outer edge of the posterior tibiæ is quite feeble and must be looked for with some care.

Occurs in Georgia and Florida.

20. **E. texana** Crotch.—Elongate oval, subdepressed, moderately shining, beneath reddish yellow, above pale yellow, each elytron with the sutural and median vitta. Antennæ slender, longer than half the body, outer half piceous, basal five joints paler, third and fourth joints equal. Head reddish yellow punctate, a deep impression from eye to eye, frontal carina obtuse, tubercles indistinct. Thorax not quite twice as wide as long, very little wider at base than apex, sides arcuate, margin moderately explanate, anterior angles slightly dentiform, surface finely alutaceous, sparsely punctate; scutellum black. Elytra not wider at base than the thorax, oblong oval, humeri obliterated, umbone not distinct, margin not explanate, moderately coarsely, not densely punctate, smooth near apex, color pale yellow, normally with the sutural vitta entire, a median vitta exactly parallel not reaching the apex. Epipleuræ pale. Body beneath and posterior legs reddish yellow, front and middle legs paler. Abdomen shining, very coarsely punctured. Length .16—.18 inch.; 4—4.5 mm. Plate V, figs. 9—12.

This species is very like a *Systena* in form and coloration, being but little broader.

The markings vary notably. The vitta normally are as described, extending from the basal edge. Specimens occur in which the median vittæ do not reach the base; others again have the vittæ confluent in a discal space, in which, however, the edges are irregular. Still more rarely the sutural vitta alone remains. The head may be fuscous.

The only species with which some varieties of this might be confounded is *thyamoides*, which is broader, the sides of elytra distinctly explanate, and the discal spot regularly oval, not reaching the apex.

Occurs in Texas (Dallas).

21. **E. thyamoides** Crotch.—Oval, subdepressed, moderately shining, reddish yellow beneath, pale yellow above, elytra with a broadly oval, common, black spot. Antennæ slender, longer than half the body, piceous, three or four basal joints paler, third and fourth equal. Head pale, occiput slightly darker, finely alutaceous, sparsely punctate, a deep, transverse, interocular impression, frontal carina obtuse, the tubercles indistinct. Thorax more than twice as wide

as long, distinctly broader at base than apex, sides arcuate, margin rather broadly explanate, front angles dentiform, surface finely alutaceous, sparsely indistinctly punctulate; scutellum black. Elytra oval humeri rounded, margin narrowly explanate and slightly reflexed, surface rather coarsely and closely punctate, smoother near the apex, color yellow, with a common discal black space, never reaching the apex, variable in extent. Epipleuræ pale. Body beneath and legs reddish yellow, abdomen smooth, sparsely indistinctly punctate. Length .15—.18 inch.; 4—4.5 mm. Plate VI, fig. 8.

This species resembles, in minature, *Disonycha discoidea*. It varies but little, except in the extent of the black discal space, which at times leaves but a narrow pale border, while it may become so narrow as to occupy but half the space between the suture and margin on each side.

Occurs west of the Mississippi River from Dakota to Texas.

22. **E. limbalis** Mels.—Broadly oval, subdepressed, moderately shining, yellowish testaceous, darker beneath, elytra with short fuscous vittæ, often confluent in a large discal spot. Antennæ slender, longer than half the body, testaceous, darker externally, third and fourth joints equal. Head pale, occiput darker, fuscous, never piceous, surface alutaceous, sparsely punctate, a deep interocular impression. Thorax nearly three times as wide as long, widest at base, sides arcuate, margin broadly explanate, front angles not dentiform, surface alutaceous, obsoletely, sparsely punctulate. Elytra broadly oval, margin explanate and slightly reflexed, umbone moderately prominent, slightly impressed within, surface moderately, coarsely and closely punctate, with fuscous vittæ as follows: a very narrow sutural vitta, not reaching the base, a short oblique vitta each side of scutellum, a slightly oblique vitta beginning at the umbone extending two-thirds to apex, a shorter vitta from the umbone parallel with the lateral margin; these vittæ may be one or all absent, or all confluent in a large discal space. Epipleuræ yellow, wide. Body beneath darker than above, sometimes pale brown. Abdomen shining, sparsely punctate. Length .14—.20 inch.; 3.5—5 mm. Plate VI, fig. 7.

This is the most broadly oval species in our fauna. The elytral sculpture varies in degree from relatively fine to coarse. The markings vary as indicated above. This species is closely related to *oculata* and *sublineata*, which occur south of our fauna, in both of which there is a similarity of style of elytral marking. Ours is especially related to *oculata* as figured, but which seems to me doubtfully determined in Biol. Cent. Am.

The typical specimen described by Melsheimer is one of those in which the elytra are black, with the outer and apical border narrowly pale, resembling *thyamoides*, and also *quercata*. From the former it may be distinguished by the epipleural structure and from the latter by the more oval (not quadrate) elytra with much more

evident punctuation. The striped form, which, for convenience, may be known as *subvittata*, seems the more abundant, and it is remarkable that it has not received a name.

Occurs from Massachusetts to Iowa, Georgia and Texas, and intermediate localities.

23. **Œ. sexmaculata** Illig.—Oblong oval, depressed, not shining, above reddish yellow, thorax and elytra with piceous spots. Antennæ slender, longer than half the body, yellowish testaceous, third and fourth joints equal. Head reddish yellow, occiput piceous, alutaceous, coarsely sparsely punctate, a short, moderately deep, transverse impression between the eyes, frontal carina obtuse, tubercles not distinct. Thorax twice as wide as long, arcuately, but slightly narrowing to apex, margin widely explanate, anterior angles feebly dentiform, surface alutaceous, coarsely not closely punctate, color reddish yellow with a large brown space each side. Elytra a little wider at base than the thorax, humeri obtuse, umbone moderately prominent, smooth, a distinct, rather long sulcus within it and a distinct costa or plica extending from the umbone nearly to the apex, margin distinctly explanate, surface coarsely, deeply and moderately closely punctate, color reddish yellow, with piceous or black spots as follows: one at umbone, a second posteriorly near the side margin, a third between these, but near the suture, these are often connected, forming a broad X, behind the middle an irregular transverse fascia, broadest at the suture. Epipleuræ pale, broad in the entire length. Prothorax beneath pale. Meso-metasternum piceous, abdomen reddish, usually darker at middle, surface finely alutaceous, sparsely punctate, with few hairs. Legs rufotestaceous. Length .14—.16 inch.; 3.5—4 mm. Plate VI, fig. 3.

While this species varies considerably in the extent of its elytral markings it is readily known by the very coarse punctuation of the entire upper surface and the costa which extends from the umbone to near the apex. There is often a second short costa within this near the apex.

Occurs from the New England States westward to Missouri and south to Florida.

24. **Œ. suturalis** Fab.—Oblong oval, depressed, feebly shining, pale yellow, base of elytra, suture and spots on each side brown. Antennæ longer than half the body, slender, testaceous, third joint very slightly shorter than the fourth. Head yellow in front, vertex and occiput brown, coarsely and sparsely punctate, a deep transverse depression between the eyes, frontal carina short and obtuse, the tubercles smooth. Thorax more than twice as wide as long, sides arcuately narrowed to apex, margin broadly explanate, front angles dentiform, color yellow, immaculate, alutaceous, sparsely and very indistinctly punctate. Elytra not wider than the thorax, humeri obtuse, umbone moderate, limited within by a distinct sulcus, margin distinctly explanate, surface coarsely and moderately closely punctate, smoother at apex, color pale yellow, the base between the umbones, suture three-fourths to apex, and often two spots on each elytron brown. Epipleuræ broad, pale. Body beneath and legs pale. Abdomen shining, sparsely punctate. Length .14—.16 inch.; 3.5 –4 mm. Plate VI, fig. 5.

It is remarkable that this species should have been made a synonym of *quercata* after the good description and figure by Olivier. The brown color on the elytra extends along the base between the umbones on each of which it forms a slight hook. The lower edge curves inward and downward along the suture, at the middle of the suture it is angulate, opposite which is a round spot, extending to three-fourths the band terminates abruptly with an angulation opposite which is another spot. Either one or both of the spots may be wanting.

Occurs in Georgia and Florida.

25. **E. quercata** Fab.—Oval, depressed, piceous, thorax entirely or with the sides pale, elytra with pale border, surface moderately shining. Antennæ slender, longer than half the body, pale yellowish, the outer joints often darker, third joint slightly shorter than the fourth Head piceous, front paler, a very few indistinct punctures posteriorly, interocular depression deep, frontal carina obtuse, tubercles not distinctly separated. Thorax more than twice as wide as long, arcuately narrower to apex, margin widely explanate, disc finely alutaceous, obsoletely, finely, sparsely punctate, anterior angles dentiform, color often entirely yellow (*quercata*), sometimes piceous with the border yellow (*obsidiana*). Elytra not wider at base than the thorax, humeri rounded, umbone distinct, within sulcate, margin explanate, disc distinctly punctate, smoother near apex, color piceous, the entire margin pale, narrower along the sides, wider at apex. Epipleuræ broad, pale. Body beneath and posterior legs piceo-rufous, front and middle legs pale. Abdomen shining, sparsely, indistinctly punctate. Length .14—.15 inch ; 3.5—4 mm. Plate VI, figs. 1-2-4.

In addition to the two varieties above indicated, a specimen (Pl. VI, fig. 4) from Illinois varies in a peculiar way. The elytra are dark brown, the entire limb as usual pale and with a transversely oval spot at basal third, another behind the middle, these broadly united along the suture. No other differences can be detected, and I therefore consider it merely a variation.

Widely distributed in the entire eastern United States.

26. **E. scalaris** Mels.—Oval, slightly oblong, depressed, shining. Antennæ slender, half as long as the body, piceous, basal joints paler, third and fourth equal. Head in great part pale, piceous along the middle, very indistinctly punctate, interocular depression deep, frontal carina obtuse, tubercles distinct. Thorax more than twice as wide as long, arcuately narrowed to the front, margin widely explanate, anterior angles dentiform, surface alutaceous, very sparsely and finely punctate, color yellow, with a brownish spot on each side, sometimes forming a large discal space. Elytra not wider at base than the thorax, humeri rounded, umbone distinct, limited within by a distinct sulcus, margin moderately explanate, surface rather coarsely punctate near the base, smoother at tip, general color yellow, a broad basal black fascia of irregular form enclosing a pale

spot each side of scutellum, an oblique band extends from umbone toward the suture and at middle of elytra bends abruptly outward toward the margin, a transverse fascia at apical third tridentate on front and posterior borders, extending narrowly along the suture in front. Epipleuræ pale, broad. Body beneath piceous. Abdomen brown, paler at apex, finely alutaceous, sparsely punctate. Legs entirely pale. Length .18—.20 inch.; 4.5—5 mm. Pl. V, figs. 17—20.

The above description of elytral markings is such as will be found in the majority of specimens. There is, however, very great variation in the extent of the black markings by increase or decrease of the style described.

A specimen in my cabinet from North Carolina has the elytra nearly as in *quercata*, except that there is a small oblique pale spot on each side slightly in front of middle and nearer the suture.

A specimen from Texas has much smoother elytra and with the black reduced to spots placed as follows: one on umbone, a second posterior and more internal, third at middle and larger, a fourth smaller, between this and apex, near the margin are small spots, one between the first two, a second opposite the large spot. With more specimens to prove its constancy this latter may be found specifically distinct. Unless there are some well defined structural characters it is far better to allow doubtful uniques to remain unnamed, especially in Chrysomelidæ.

Occurs from the Middle States to Kansas, Georgia and Texas.

Group V.—ASPICELÆ.

Antennæ 10-jointed. Prothorax transverse, without discal impressions at base. Anterior coxal cavities open behind. Mesosternum distinct. Tibiæ (especially the posterior) broadly grooved on their outer edge for nearly their entire length, the groove limited each side by a ridge. Last joint of posterior tarsi not globoso-inflated, although at times thickened.

This group occupies nearly an intermediate position between the Œdionyches and Disonychæ, differing from the former in the absence of the inflated joint and from the second by the broadly grooved tibiæ.

Two genera are known in our fauna:

Antennæ filiform; last joint of hind tarsus gradually thicker toward apex; posterior tibiæ sinuate on the outer edge near the apex..... **Homophœta.**

Antennæ flattened, broader at middle, slender at tip; last joint of hind tarsus slender; tibiæ not sinuate.. ..... **Phydanis.**

With Homopheta I have united Asphæra, as there does not seem to be any *structural* character separating them. It will be observed that Mr. Jacoby places them side by side in the "Biologia," while in the "Genera" Chapuis placed them in separate tribes.

The species belonging to this tribe are all from the southwest, from the Rio Grande region.

HOMOPHŒTA Chev.

The differences between this genus and Edionychis reside entirely in the fact that the claw joint of the posterior tarsus is not abruptly globularly dilated, but is gradually expanded toward the tip in an ovate manner. This, too, is somewhat variable, and while well marked in *æquinoctialis* and *abdominalis* is scarcely more dilated in *lustrans* than in Disonycha. The posterior tibiæ are grooved on the outer edge and above the insertion of the tarsi is sinuate and with the small tooth as will be observed in Edionychis. Pl. VII, fig. 12.

Under the above name I have united species which are now placed in two genera: *Homopheta* and *Asphæra*. I find it impossible to define these genera, much less to place them in separate tribes, and I am forced to believe that many of the genera of Halticini have no other basis than cabinet convenience without structural difference.

The species known to me are:

Elytra blue, or violet-black, with large yellowish white spots; head in great part black; abdomen yellow ..... **æquinoctialis.**

Elytra bright blue, smooth; head almost entirely yellow; abdomen yellow. **lustrans.**

Elytra dull blue, distinctly punctate; head entirely black; abdomen piceous, vaguely paler at apex and sides ..... **abdominalis.**

These species are all from our southwestern limits.

H. æquinoctialis Linn.—Oval, slightly oblong, surface shining, thorax yellow, elytra violet-black, with four more or less oval, yellow-white spots on each side and a short submarginal stripe. Antennæ slender, more than half the length of the body, piceous, underside of two basal joints testaceous. Head black, frontal spot and clypeus yellow, labrum black, frontal tubercles indistinct, surface smooth, a few punctures near the eyes. Thorax not twice as wide as long, very little wider at base than apex, sides arcuate, margin narrowly explanate, anterior angles not dentiform, surface smooth and shining. Elytra scarcely wider at base than the thorax, humeri rounded, umbone not prominent, surface smooth, shining, violet-black, with yellow-white spots arranged as follows: one on each side of scutellum, one posteriorly near the side, one at middle near the suture, somewhat oblique, a transversely oval spot near the apex, a short subhumeral stripe. Epipleuræ black. Body beneath entirely reddish yellow. Anterior and middle legs entirely piceous, posterior femora yellow, tibiæ and tarsi piceous. Length .30 inch.; 7.5 mm.

The conspicuous marking on the elytra render this an easily known species. As far as specimens have been examined it is practically invariable in its markings.

Occurs quite commonly in Texas near the Rio Grande, extending through Mexico to Brazil.

H. lustrans Crotch.—Oval, moderately shining, beneath in great part yellow, head and thorax yellow, elytra cobalt-blue. Antennæ half as long as the body, piceous; underside of two basal joints pale. Head entirely yellow, except a narrow fuscous band between the eyes, frontal tubercles distinct, a transverse impression above them, surface entirely smooth. Labrum piceous. Thorax twice as wide as long, widest at base, sides slightly arcuate, margin not explanate, anterior angles simple, color yellow, smooth and impunctate. Elytra a little wider at base than the thorax, humeri rounded, umbone moderately distinct, limited within by a slight impression, surface smooth, almost absolutely impunctate. Epipleuræ black Body beneath and abdomen entirely yellow, the sides of the metasternum sometimes piceous. Femora yellow, the anterior and middle tibiæ and tarsi piceous, sometimes paler on the inner side, posterior tibiæ piceous near the tip. Abdomen shining, sparsely punctate. Length .26 inch.; 6.5 mm.

This insect bears a very close resemblance to *Dison. varicornis.* The claw joint of the posterior tarsus is still less thickened than in either of the species of this genus, and, by the systems of classification, would be very difficult to place generically. It is not, however, a true Œdionychis, and the only course to adopt is that suggested by Harold.

Occurs in Texas.

H. abdominalis Chev. Oval, feebly shining, beneath piceous, thorax yellow, elytra blue, or blue-black Antennæ half as long as the body, piceous, third joint slightly shorter than the fourth. Head black, shining, frontal tubercles moderately distinct, a transverse depression above them, surface smooth, a few punctures near the eyes. Thorax twice as wide as long, distinctly broader at base, sides arcuate, margin moderately explanate, front angles not dentiform, color yellow, surface smooth and impunctate. Elytra a little wider at base than the thorax, humeri rounded, umbone moderate, limited within by a distinct depression, surface closely punctate, more coarsely and densely in the female. Epipleuræ black. Body beneath black, shining, abdomen black, the apex and sides indeterminately rufous, surface sparsely punctate. Femora of all the legs yellow, tibiæ and tarsi black. Length .30—.40 inch.; 7.5—10 mm.

The elytral sculpture is very like that of *Œd. thoracica* in the female, but in the male the punctures are finer and apparently less closely placed.

The specimens marked Texas in my own and the LeConte cabinet were from the old Berlandiere collection, and are open to some doubt as to locality. It is common in the adjacent regions of Mexico.

PHYDANIS n. g.

Head oval, inserted as far as the eyes, front oblique, the carina short, obtuse, bifurcate in front, forming an elevated margin, which extends to the sides of the buccal cavity, the tubercles distinct, separated by a deeply impressed line, sides of head in front of eyes deeply concave, forming a lodgement for the first antennal joint. Labrum transverse, entire, the basal membrane visible. Maxillary palpi short and stout, second joint conical, third obovate, truncate, fourth conical and slightly longer. Eyes oval, not prominent. Antennæ a little longer than half the body, flattened, more slender to apex, first joint moderately long and stout, the underside broadly flattened and smooth as well as concave longitudinally, second joint oval, narrower than the first and not more than one-third as long, third joint longer and broader, wider at apex, fourth joint similar, 5–7 equal in length, a little shorter than fourth and gradually narrower, 8–10 gradually longer and less flattened, eleventh longer, slender, the apex prolonged. Thorax very broad, broadly emarginate at apex, the anterior angles obtuse in front, sides feebly arcuate, narrowly margined, hind angles distinct, base arcuate, more lobed at middle, a distinct basal marginal line, but no discal impressions. Elytra not wider than thorax, sides feebly arcuate, disc convex with confused punctuation, but with coarser punctures forming indistinct striæ near the base. Prosternum moderately separating the coxæ, nearly as elevated, apex not broader, the coxal cavities rather widely open behind. Mesosternum distinct, oblique. Ventral segments all free. Legs rather stout, the tibiæ all broader toward apex, their outer edge rather broadly and deeply sulcate, with an elevated margin each side. Posterior tibiæ obliquely truncate, with a short terminal spur. Anterior and middle tarsi with first joint oval, second shorter and narrower, third bilobed, fourth slender. Posterior tarsi with first joint slender, a little shorter than the following joints together. Claws on all the feet distinctly appendiculate. Form oblong oval, glabrous, body winged.

After as careful a search of the literature as possible no genus has been found to which the above description will apply. The antennal characters do not seem to be at all like this in any other Halticide.

The first joint when in repose is folded obliquely downward and backward in front of the eye resting in a broad and deep concavity between the eye and the lateral border of the mouth, the bifid frontal carina forming the anterior border of the concavity. The first an-

tennal joint is broadly flattened beneath and bent to conform to the curve of the side of the head. The third and fourth joints are the broadest, and from this they gradually narrow to apex. When the antennæ are viewed on their narrow edge all the joints are equally thick, but when seen from above are as described. The legs are all rather stout, the four anterior femora being slightly swollen also, the posterior are broadly oval and but feebly sulcate for the tibiæ.

These rather peculiar characters make the genus not an easy one to place satisfactorily, but taking the other characters in reference to their importance in other genera—the open coxal cavities, the non-impressed thorax and the broadly sulcate and margined tibiæ—no other course remains than to place it in the Aspicelites of Chapuis.

P. bicolor n. sp.—Oblong oval, moderately convex; beneath—head and thorax reddish yellow, elytra bluish (not unlike in form and color to *Gastroidea polygoni*). Antennæ brownish, three basal joints rufotestaceous. Head sparsely, very finely punctate. Thorax nearly three times as wide as long, slightly narrowed in front, sides feebly arcuate, disc moderately convex, with two or three vague depressions at the declivity, surface finely, indistinctly punctate Elytra not wider at base than the thorax, humeri broadly rounded, umbone not prominent, sides feebly arcuate, disc moderately convex, the punctures moderately fine and closely placed, with coarse punctures forming indistinct striæ, which extend nearly to middle. Abdomen punctate and wrinkled, sparsely pubescent. Length .14—.16 inch.; 3.5—4 mm. Plate VI, fig. 10.

The male has the first joint of the anterior tarsi more dilated than the female. The last ventral sinuate each side, the middle lobe narrow and short.

As remarked above the first appearance of this insect recalls *Gastroidea polygoni*, but it is less convex and with finer punctuation.

Occurs in southwestern Texas; collected by Mr. S. F. Aaron.

Group VI.—DISONYCHÆ.

Antennæ 11-jointed. Thorax with base arcuate at middle, more or less obliquely sinuate each side. Anterior coxal cavities open behind. Posterior tibiæ usually feebly sulcate near the apex. Claw joint of hind tarsus not inflated, the claws appendiculate.

This group has been separated from the Halticites of Chapuis in consequence of the absence of any ante-basal impression of the thorax. It has been found very inconvenient to retain the group as constituted by Chapuis from the fact that the definition should include

the statement that an ante-basal impression is present, and to admit an exception in which the most conspicuous species are included would be, at least, confusing.

Two genera are known to me as occurring in our fauna:

Thorax with an oblique sinuation each side of base; prosternum moderately separating the coxæ and not depressed between them; second joint of antennæ much shorter than third..... **Disonycha.**

Thorax regularly arcuate at base; prosternum very narrow between the coxæ and depressed between them; second joint of antennæ very little shorter than third..... **Hemiphrynus.**

The latter genus is instituted for *Phrynocepha intermedia* Jacoby and some allied forms which cannot remain as placed. Phrynocepha, having *pulchella* as the type, has broadly sulcate and bicarinate hind tibiæ, and must be placed in the *Aspicelites*. It is remarkable that so obvious a character should have escaped notice.

DISONYCHA Chev.

Head inserted as far as the eyes, front declivous, frontal carina distinct, sometimes acute, joining the thickened border of the clypeus in front, above the end of the carina are two tubercles usually well marked, separated by a fine line. Antennæ slender, rarely longer than half the body, the fourth joint longer than the third, except in the species with blue elytra, where they are about equal. Thorax as wide at base as the elytra, narrowed in front, the apex truncate, or feebly emarginate; anterior angles not prominent, base either rounded at middle or slightly emarginate opposite the suture, the sides obliquely sinuate, although at times feebly; disc convex, without distinct ante-basal transverse depression in any of our species. Scutellum triangular, broader than long. Elytra oblong, or oval; the epipleuræ gradually narrower from base to apex. Prosternum variable in width between the coxæ, usually narrow, the cavities open behind, angulate externally, exposing the trochantin. Metasternal side pieces moderate in width, with parallel sides. Legs moderate, posterior thighs fusiform, grooved beneath; tibiæ more or less distinctly bisulcate on the outer face without trace of sinuation or tooth above the tarsi, terminated by a moderate spur (Plate VII, fig. 16). Tarsi slender, moderately long, the first joint of the posterior pair as long as the next two; claws appendiculate at base.

In the males the last ventral segment is truncate, the pygidium vertical and convex; in the female the last ventral is oval and the pygidium horizontal.

As represented in our fauna, Disonycha is far more homogeneous than Œdionychis, the species not exhibiting any marked structural differences among themselves, consequently any attempt at tabulation is more or less based on coloration, which seems to be quite constant as to type, but variable in degree.

The genera with which Disonycha is associated are extremely difficult to separate by sharply drawn characters. The species of Haltica have the tibiæ longitudinally sulcate, but in a less marked degree The base of the thorax, although generally regularly arcuate, is in some species quite oblique each side as in Disonycha. Phrynocepha is especially indistinct, the more so when we consider the species at present referred to it.

The species at present known to me may be separated by the following table, the arrangement in a sequence by facies is shown by the numbers:

Form elongate, parallel, elytra subsulcate; thorax rather irregularly convex; elytra yellow, with black vittæ.....1. **pennsylvanica.**
Form more or less oval, elytra even; thorax regularly convex.....2.
2.—Elytra vittate.....3.
Elytra with large discal spot black.....10. **discoidea.**
Entire body above black, subopaque.....11. **funerea.**
Elytra dark violet, blue or green.....8.
3.—Elytra with a submarginal vitta.....4
Elytra without submarginal vitta.....7.
4.—Abdomen densely punctured, subopaque, the pubescence conspicuous.....5.
Abdomen very sparsely punctured and shining, pubescence scarcely visible..6.
5.—Head coarsely punctured from side to side, occiput piceous or brown. 2. **quinquevittata.**
Head smooth at middle.
Elytral vittæ rather broad, head and metasternum more or less fuscous or piceous, labrum piceous.....3. **crenicollis.**
Elytral vittæ narrow, head and body beneath always pale yellow; labrum pale.....4. **caroliniana.**
6.—Thorax distinctly punctured.
Head smooth at middle; epipleuræ pale.....5. **arizonæ.**
Head with coarse, deep punctures; epipleuræ black.....6. **maritima.**
Thorax smooth; head rough; epipleuræ black.....7. **glabrata.**
7.—Median elytral vitta broad; antennæ normal; thorax not spotted. 8. **abbreviata.**
Median vitta extremely narrow; antennæ slender, three-fourths the length of body; thorax with two spots.....9. **tenuicornis.**

8.—Body beneath and legs entirely black; thorax with three spots in triangle; elytra punctate .....12. **triangularis.**

Body beneath and legs in part at least yellow.....9.

9.—Posterior femora entirely or in part piceous.

Body beneath entirely yellow.

Head entirely yellow; antennæ with four basal and one or two terminal joints yellow, femora (except posterior at apex) yellow; tibiæ and tarsi black; elytra bright violaceous blue.....15. **varicornis.**

Head piceous; antennæ piceous; legs entirely black; elytra blue-black, rather dull.....14. **cervicalis.**

Abdomen alone entirely yellow, hind femora bicolored, or entirely black; head piceous; elytra blue-black.....13. **xanthomelæna.**

Abdomen piceous at middle, apex and sides yellow, legs bicolored; head bicolored; elytra brilliant blue.....16. **politula.**

Posterior femora entirely yellow; abdomen piceous, apex and sides yellow; head bicolored.

Elytra blue or violet, form of body oval, as in *xanthomelæna*. 17. **mellicollis.**

Elytra bright green, form more oblong.....18. **collata.**

1. **D. pennsylvanica** Illig.—Oblong, nearly parallel. Antennæ a little longer than half the body, moderately stout, black, except usually the underside of three basal joints. Head black, front yellow, surface nearly smooth, except a small group of punctures near each eye. Labrum piceous or brown. Thorax more than twice as wide as long, slightly narrower in front, disc convex, somewhat uneven, a very indistinct, oblique impression beginning at the front angles extending toward the middle, behind which is a more or less developed umbone; lateral margin rather wide, the submarginal impression deep, surface shining nearly smooth, the punctures very fine and indistinct; color pale yellow, with black spots varying in size and number. Scutellum black. Elytra yellow, or yellowish white, with the suture, a marginal vitta (these rarely joining at apex) and a median vitta not reaching the apex, black; surface subsulcate, especially near the sides, punctuation variable, either quite distinct or entirely obsolete. Body beneath nearly entirely black, side margin of elytra and outer side of epipleuræ yellow, the inner margin usually piceous. Abdomen densely punctured and finely pubescent. Legs variable in color from black to rufescent. Length .26—.30 inch.; 6.5—7.5 mm.

As might be expected in a species of such wide distribution, there is considerable variation, the types of which will be considered separately.

Limbicollis Lec.—Antennæ entirely black. Thorax with the spots confluent in a large discal black space having a comparatively narrow yellow border. Thorax beneath black, narrowly margined with yellow. Body beneath and legs black.

Pennsylvanica Illig.—Head in part yellow. Prothorax reddish yellow, with a central black spot, round in front and gradually narrowed posteriorly, beneath entirely yellow. Body beneath black,

abdomen at sides and apex paler. Legs in great part black. The two described as *uniguttata* Say and *vicina* Kby. are synonyms of this variety.

Pallipes Crotch agrees with the preceding, except that the legs are reddish yellow and the tibiæ slightly darker, tarsi piceous.

Conjugata Fab.—In this form the usual black of the surface is replaced by rufous, and the legs, even to the tarsi, reddish yellow.

In addition to the above a form occurs in Florida and Louisiana somewhat smaller, with the entire head, antennæ, underside and legs black. The black vittæ of the elytra are also unusually broad, so that the pale yellow is reduced to a narrow thread.

The normal marking of the thorax consists of five spots, two forming an anterior row slightly behind the anterior margin, three forming a posterior arcuate row. Often the spots forming the central triangle are confluent, and the lateral spots wanting, while in the var. *limbicollis* they are all fused, forming a large discal space. Varieties often occur with the thorax immaculate, giving the species again an entirely different aspect, but the form is well recognized as a mere variety.

Among the species with vittate elytra this one is known by the parallel form, subsulcate elytra and almost entirely black head.

This species occurs all over the United States and Canada, but is more especially the species of the northern region, that is to say, it extends east and west north of the fortieth parallel of latitude.

2. **D. quinquevittata** Say.—Oblong oval. Antennæ a little longer than half the body, piceous, the under and posterior side of the first three joints testaceous. Head yellow, and, except in rare instances, with the occiput piceous, vertex with coarse and deep punctures extending from one side to the other, frontal carina broad and obtuse, the tubercles well marked. Labrum black. Thorax twice as wide as long, narrowed in front, anterior angles distinctly prominent, sides feebly arcuate, the margin narrower, disc not evenly convex usually a slight umbone at the position of the outer dark spot, surface very minutely and sparsely punctate; color yellow, normally with five spots arranged in an anterior row of two and a posterior of three, often with the two spots only. Scutellum black. Elytra distinctly wider at base than the thorax, humeri obtuse, umbone moderately prominent, surface sparsely finely punctulate, yellow, a narrow sutural stripe, a submarginal line often incomplete at base and not joining the sutural at apex, a very narrow median vitta. Epipleuræ pale. Body beneath reddish yellow, metasternum usually piceous. Abdomen densely punctured, the pubescence close and conspicuous. Legs reddish yellow, the tibiæ at tip darker, tarsi piceous. Length .22—.36 inch.; 5.5—9 mm.

This species exhibits very nearly as much variation as *pennsylvanica*, while preserving a facies which enables it to be quite readily recognized.

In the normal form the five spots on the thorax are well marked, and the metasternum entirely or in great part piceous. The spots may become obliterated until only the two anterior ones remain.

Specimens from near Fort Yuma have the underside entirely yellow, while the thoracic spots may be well developed. These have been described as *pura* Lec.

Rarely individuals occur with the median elytral vitta entirely wanting, still more rarely the submarginal vitta is wanting.

The median vitta is usually very narrow, but specimens from Missouri in my cabinet have all the vitta a little wider, so that the yellow space on either side of the median vitta is not wider than the vitta.

The oblong form of this species makes it intermediate between the parallel form of *pennsylvanica* and the more truly oval form of those which follow.

From the two species which follow, having the abdomen densely punctured, it may be known by the coarsely punctured vertex; *caroliniana* has a pale head and labrum, *crenicollis* has a more oval form, wider vittæ and the sutural and marginal unite at apex.

This insect has long borne the name *alternata* in our cabinets through an erroneous interpretation of Illiger. It cannot be *alternata* because that species is described from Carolina and Pennsylvania, and it is quite unlikely that Illiger could have had specimens of an essentially western species in his hands in 1807. Moreover, Illiger describes *alternata* as having a pale head. It is more than probable that *alternata* is a synonym of *caroliniana*, as will be seen by reference to remarks under that species.

From the fact that the name given by Say is now disposable I have used it in preference to any of the names which have been given in more recent times.

The present species is especially that of the entire region west of the Mississippi River, extending from our northern boundary to Mexico and from the Mississippi to the Pacific. Single specimens are in my cabinet from Illinois, Virginia and Massachusetts.

3. **D. crenicollis** Say.—Oval, slightly narrower in front. Antennæ half the length of the body, black, the three basal joints pale on the under and posterior side. Head either entirely yellow or with the occiput piceous, frontal carina very obtuse, the tubercles feeble or absent, surface smooth, a feebly punc-

tured depression at the upper inner angles of the eye. Labrum always black. Thorax twice as wide as long, narrower in front, sides feebly arcuate or nearly straight, the margin narrower, disc convex, smooth, nearly impunctate, yellow or slightly reddish, usually with three piceous spots placed in a triangle, the anterior pair oval and larger, the posterior linear, rarely with a lateral spot on each side. Scutellum black. Elytra scarcely wider than the thorax at base, humeri rounded, the umbone not distinct, surface smooth or indistinctly punctulate, color yellow; suture, submarginal vitta (these united at apex) and median vitta black, this as wide as the yellow space on either side, extreme margin of elytra and outer side of epipleuræ yellow, inner side piceous. Prothorax beneath yellow. Metasternum usually black, abdomen yellowish or pale brown, densely punctured and with very conspicuous silken pubescence. Femora reddish yellow, piceous along the upper edge, tibiæ and tarsi piceous. Length .22—.26 inch.; 5.5—6.5 mm.

This species is closely related to *caroliniana*, and is difficult to distinguish by description. The labrum is here always piceous, the metasternum in great part piceous, except in rare examples; the legs are always darker, the abdomen more densely punctured and the pubescence more abundant. It is also observed that *crenicollis* has the median elytral vitta as wide or wider than the yellow on each side and in the vast majority of specimens the sutural and marginal vittæ join at the tip, while in *caroliniana* the reverse is the case in both characters.

Occurs from New York to southwestern Texas and Mexico.

4. **D. caroliniana** Fab.—Oval, slightly narrower in front. Antennæ half the length of the body, piceous, the underside of three basal joints pale. Head entirely yellow, entirely smooth, except a punctured fovea at the upper inner border of the eye, frontal carina obtuse, tubercles small. Labrum always pale. Thorax convex, more than twice as wide as long, distinctly narrowed in front, sides feebly arcuate, margin narrow, surface polished with very indistinct, sparse punctures, two piceous spots of variable size behind the apical border, these are rarely absent. Scutellum black. Elytra scarcely wider at base than the thorax, humeri indistinct, yellow (when recent slightly reddish), a narrow sutural black border, a marginal line not covering the edge, which very rarely joins the sutural, a median vitta narrower than the yellow spaces on either side, surface usually impunctate, rarely obsoletely punctulate. Body beneath reddish yellow. Epipleuræ internally piceous, sometimes entirely yellow. Abdomen closely punctate, pubescence distinct. Legs reddish yellow, tibiæ at tip and tarsi piceous. Length .20—.26 inch.; 5—6.5 mm.

Very little variable, except as noted above. In the Florida specimens before me the epipleuræ are entirely pale.

With this species I have united *alternata* Illig. as a synonym. From Illiger's description (Magaz. vi, p. 144) of *caroliniana* it is evident that he had not seen the Fabrician type, and the description

is made up entirely of a rescript of those of Fabricius and Olivier, while the supposed differences are diagnosed from the figure given by the latter author. *D. pulchra* Casey is described from a very fresh specimen.

Occurs from Pennsylvania to Florida. A specimen from Missouri in my cabinet is doubtful as to locality.

5. **D. arizonæ** Casey.—Oval, slightly narrower in front. Antennæ scarcely half the length of body, black, the underside of three basal joints pale. Head entirely reddish yellow, frontal carina and tubercles indistinct, a group of coarse punctures on the front at the upper border of each eye. Labrum fuscous. Thorax yellow, more than twice as wide as long, narrowed in front, sides feebly arcuate, margin narrow, disc regularly convex, usually shining, sometimes slightly alutaceous, sparsely indistinctly punctate, a small piceous spot on each side of middle, placed more distantly from each other than from the apical border. Scutellum black. Elytra wider at base than the thorax, humeri obtuse, callus not prominent, surface very distinctly, but not closely punctate; color yellow, a narrow sutural black vitta joining the marginal, which does not include the extreme edge or epipleuræ; a median vitta wider than the sutural, but narrower than the yellow space on either side. Epipleuræ pale, at most slightly fuscous internally. Body beneath yellow or testaceous, legs somewhat more reddish, the tibiæ at tip and tarsi piceous. Abdomen slightly alutaceous, shining, punctures very sparse, pubescence short and sparse. Length .22—.26 inch.; 5.5—6.5 mm.

From either of the species with comparatively smooth abdomen this may be known by the narrow median vitta, pale epipleuræ and entirely pale head. Superficially it bears a close resemblance to *caroliniana*, in which, however, the abdomen is closely punctate and very distinctly pubescent.

Occurs in southern Arizona.

6. **D. maritima** Mann.—Oval, slightly narrower in front. Antennæ half the length of body, black, the underside of three basal joints paler. Head black, front yellow, the frontal carina and tubercles well marked, some very coarse punctures placed across the vertex. Labrum piceous. Thorax yellow, without spots, more than twice as wide as long, narrowed in front, sides arcuate, margin narrow, disc regularly convex, distinctly punctate, the punctures rather coarse, not close. Scutellum black. Elytra very little wider at base than the thorax, humeri rounded, callus not prominent, suture and entire margin including the epipleuræ, a rather broad median vitta black, the intervening space yellow, surface finely, sparsely and indistinctly punctate. Prothorax beneath yellow. Body and abdomen black, the last segment yellow; surface of abdomen shining, finely, transversely strigose with few scattered, coarse punctures and very few short hairs. Legs black, the outer side of the tibiæ yellow. Length .16—.20 inch.; 4—5 mm.

This species is about as little variable as any in the genus. It may be readily known by the distinctly punctate thorax and black underside.

Occurs in California and Nevada.

7. **D. glabrata** Fab.—Oblong oval, surface very shining as if varnished. Antennæ half the length of the body, black, three basal joints testaceous posteriorly. Head variable color, often entirely black, except the front, sometimes nearly entirely yellow, but always with the posterior portion of the occiput fuscous, frontal carina and tubercles well marked, surface smooth. Labrum brown. Thorax yellow, usually with a narrow median spot, sometimes an indistinct spot each side, rarely immaculate, surface smooth, shining, more than twice as wide as long, narrowed in front, sides feebly arcuate, margin narrow. Scutellum black. Elytra a little wider at base than the thorax, humeri rounded, umbone not prominent, surface smooth, shining, the punctures extremely fine and sparse; color yellow, the suture and margin, involving the epipleuræ, a median vitta black. Body beneath yellow, the posterior portion of metasternum rarely piceous. Abdomen very finely alutaceous, sparsely punctate, hairs short and sparse. Legs usually yellow, sometimes the femora are infuscate, tips of tibiæ and tarsi piceous. Length .20—.22 inch.; 5—5.5 mm.

In this species specimens rarely occur with the extreme lateral margin of the elytra and epipleuræ pale, in this case the broad median vitta, the more or less dark head, the thoracic ornamentation will distinguish it from *arizonæ*. From *maritima* it may at once be known by the pale underside and smooth thorax.

Occurs from Georgia to Arizona.

8. **D. abbreviata** Mels.—Oval, slightly oblong. Antennæ as long as half the body, piceous, the underside of three basal joints pale. Head (and labrum) yellow, the frontal carina obtuse, tubercles distinct, surface smooth, a rounded punctured fovea at the upper and inner border of the eye. Thorax twice as wide as long, narrowed in front, sides arcuate, margin narrow, surface regularly convex, smooth, entirely yellow, without spots. Scutellum yellow. Elytra slightly wider at base than the thorax, humeri obtuse, umbone distinct, a slight depression within it, surface sparsely, indistinctly punctulate, color yellow, a sutural black vitta, another median, both moderately wide, black. Body beneath and epipleuræ entirely yellow. Abdomen very sparsely punctate, rather shining, the pubescence short, sparse and inconspicuous. Legs yellow, the outer side of the tibiæ and the tarsi black. Length .24—.34 inch.; 6—8.5 mm.

This species is one of the least variable of our vittate species. When recent the yellow color is slightly tinged with red. By the absence of the submarginal vitta and the immaculate thorax this species is easily known.

Occurs from the Middle States to Florida and Texas, extending into Mexico.

9. **D. tenuicornis** n. sp.—Oval slightly oblong, facies rather robust, pale yellow, surface very shining as if varnished, elytra with a single, slender, median vitta; thorax with two piceous spots. Antennæ nearly two-thirds the length of body and slender, piceous, the three basal joints nearly entirely yellow. Head smooth, a very few large punctures near each eye, frontal carina obtuse, tubercles feeble. Thorax twice as wide as long, narrowed in front, sides feebly arcuate, margin narrow, disc regularly convex, surface polished and with two small black spots in front. Elytra wider at base than the thorax, humeri distinct, but obtuse; umbone distinct, surface shining, very obsoletely punctate, a single, slender, median vitta on each elytron, suture very narrowly piceous posteriorly. Body beneath entirely yellow. Abdomen rather densely punctulate, pubescence very distinct. Legs yellow, tarsi brown. Length .26—.30 inch.; 6.5—7.5 mm.

The four specimens before me agree perfectly with the above description. The lateral margin is slightly reddish in color, and would lead one to suspect a marginal vitta, but the same appears in *alternata*. It is a little more robust than *quinquevittata*, and may be readily known by the long, slender antennæ.

Occurs in southern Arizona (Morrison).

10. **D. discoidea** Fab.—Oval, slightly depressed. Antennæ half the length of the body, black, the lower side of basal joint piceous. Head (and labrum) yellow, surface smooth, a small fovea at the upper inner border of the eye, frontal carina very obtuse, the tubercles indistinct. Thorax more than twice as wide as long, narrowed in front, sides slightly arcuate, margin narrow, a little wider in front, disc regularly convex, smooth, shining, yellow and immaculate. Scutellum yellow. Elytra scarcely wider than the thorax, humeri almost entirely obliterated, umbone moderate, surface distinctly and moderately closely punctate, color yellow, with a large, oval, discal black spot not reaching the apex and usually having a very narrow pale basal border. Body beneath entirely yellow. Abdomen rather closely punctate, the pubescence distinct, but not conspicuous. Legs yellow, the outer side of the tibiæ and the tarsi black. Length .22—.30 inch.; 5.5—7.5 mm.

This species varies but little; the black discal space rarely reaches the basal margin, in which case the scutellum is black. The space varies in width, and at times the yellow border of the elytra is rather narrow. When recent the yellow is tinged with red as observed in nearly all the species.

Occurs from North Carolina to Texas.

11. **D. funerea** Rand.—Oval, entirely black, with a velvety, subopaque surface, last segment of abdomen and sides of the fourth yellow. Antennæ scarcely half as long as the body, rather stout, the outer joints short. Front smooth, one large puncture and several smaller near each eye, the frontal carina very flat, the tubercles indistinct. Thorax barely twice as wide as long, narrowed in front, the sides feebly arcuate, margin very narrow, disc regularly convex, impunctate, surface minutely alutaceous. Elytra not wider at base than the thorax, humeri rounded, umbone indistinct, surface minutely, obsoletely punc-

tate, finely alutaceous. Body beneath more shining than above. Abdomen alutaceous, the punctures very sparse and indistinct, the pubescence very short. Legs entirely black. Length .20—.26 inch.; 5—6.5 mm.

There need be no difficulty in the identification of this species: the antennæ are much stouter than in any other and rather shorter. The male is narrower than the female, and the oblique truncation of the base near the hind angles is very feeble.

Occurs in Georgia.

12. **D. triangularis** Say.—Form oval, rather depressed, feebly shining, entirely black, thorax reddish yellow with three black spots arranged in triangle, the anterior pair round, the posterior linear and median. Antennæ slender, half the length of the body, piceous, the three basal joints pale beneath. Head entirely black, frontal carina obtuse, the tubercles indistinct, vertex and occiput coarsely and rather closely punctate. Thorax more than twice as wide as long, narrowed in front, sides feebly arcuate, the margin very narrow, surface alutaceous rather finely, not closely punctate. Elytra a little wider at base than the thorax, humeri obtuse, umbone not prominent, surface moderately closely, distinctly punctate; color black, with a slight bluish tinge. Prothorax beneath yellow. Abdomen rather coarsely, not closely punctate, pubescence short and indistinct. Legs entirely black. Length .20—.25 inch.; 5—6.5 mm.

This species is remarkably constant in all its characters, and but little variable in size. It is readily known by the entirely black color beneath and the three spots on the thorax.

Occurs in the entire region east of the Rocky Mountains, including Canada.

13. **D. xanthomelæna** Dalm.—Oval, slightly depressed, feebly shining, thorax yellow, elytra dark blue. Antennæ slender, a little longer than half the body, piceous, the three basal joints pale beneath and in front. Head black, front piceous, frontal carina moderately prominent, tubercles distinct, occiput with a few coarse and deep punctures irregularly placed. Thorax yellow, immaculate, not twice as wide as long, narrowed in front, sides very slightly arcuate, margin narrow, surface almost entirely smooth, the punctures very minute and sparse. Elytra wider at base than the thorax, humeri rounded, umbone not prominent, surface finely alutaceous, obsoletely punctulate. Prothorax beneath yellow, metasternum black. Abdomen entirely yellow, rather densely punctate and subopaque, with distinct pubescence. Femora yellow at basal half (sometimes entirely black), the apical piceous, also the tibiæ and tarsi. Length .22 inch.; 5.5 mm.

This species has heretofore been known in our cabinets, and is the one everywhere quoted as *collaris* Fab., but I am unable to adopt this name for the following reason—the description does not apply—"*Statura et magnitudine præcedentium*" (*Œd. fasciata*, about .35 inch.; 9 mm.); "*thorax rufus, macula una alterave dorsali, nigra*" (certainly not so); "*abdomen nigrum ano rufo*" (abdomen entirely yellow); "*pedes nigri*" (bicolored here).

While there are these essential differences it will be observed that Fabricius describes it in association with species with inflated claw joint, the two species immediately preceding belonging to Lithonoma and Œdionychis, the two following to Œdionychis and Asphæra. It is probable that the name should be used rather for some of the larger Œdionyches from one of the West India islands or Cayenne. The error in the interpretation of Fabricius' species is due to Illiger. It seems to me that I am justified in rejecting the name from our fauna.

The remarks by Suffrian (Wiegm. Archiv. 1868, i, p. 180) are so unsatisfactory that it is impossible to say whether he had the true Fabrician species before him or not. It is more than likely that he did not see either the present species or *collata*.

Occurs from the New England States to Kansas and Texas and Florida.

14. **D. cervicalis** Lec.—Closely resembling *xanthomelæna*, and differing only as follows: Antennæ entirely piceous Legs entirely black, the coxæ yellow, underside of body entirely yellow. Abdomen coarsely, moderately closely punctate, pubescence feeble. Length .20 inch.; 5 mm.

Of this species I have seen but one specimen from Georgia. LeConte says (Ins. Kans. p. 25) that it occurs also in Kansas. This is the only species with blue elytra with the underside entirely pale, and, with the exception of *triangularis*, the only one with entirely black legs.

15. **D. varicornis** n. sp.—Oval, slightly oblong, moderately convex; head, thorax and entire underside yellow, elytra brilliant violaceous blue. Antennæ nearly half half as long as the body, piceous, the four basal and one or two terminal yellow. Head entirely yellow, smooth, except a fovea of coarse punctures near each eye, frontal carina broad and obtuse, tubercles small. Thorax twice as wide as long, sides feebly arcuately narrowed to the front, anterior angles very obtuse in front, a slight sinuation of the margin behind them, surface smooth, entirely yellow. Scutellum black. Elytra a little wider at base than the thorax, humeri rounded, umbone distinct, smooth, disc finely sparsely punctate at base, smooth at apex. Body beneath entirely yellow. Abdomen smooth, sparsely punctate. Anterior and middle femora yellow, the posterior tipped with piceous, tibiæ and tarsi all black. Length .24 inch.; 6 mm.

This insect bears such a close resemblance to *Asphæra lustrans* as to be readily mixed, except by careful examination. The generic characters which separate them are also quite feeble, the claw joint not being very different in the two. There is, however, a distinct sinuation of the apex of the hind tibia above the tarsus in *Asphæra* not seen in the present genus.

The species is remarkable in the color of the antennæ, the four basal joints are pale, also the two terminal in specimens from Texas, and but one in a specimen from Lower California in Mr. Ulke's cabinet.

Occurs in Texas and the Peninsula of California.

16. **D. politula** n. sp.—Oblong oval, slightly depressed, surface very shining. Antennæ slender, half the length of body, piceous, underside of three basal joints paler. Head shining, occiput blue-black, front yellow, labrum black, frontal carina very obtuse, tubercles distinct, a few coarse and deep punctures near each eye. Thorax pale yellow, immaculate, twice as wide as long, narrower in front, sides feebly arcuate, margin narrow, disc finely, sparsely and indistinctly punctulate. Elytra a little wider at base than the thorax, humeri distinct, umbone moderate, a slight depression within it, surface bright cobalt-blue, shining, distinctly, but rather densely not coarsely punctate. Prothorax beneath yellow, metasternum black. Abdomen piceous at middle, widely bordered with yellow, the surface shining, coarsely, not closely punctate, the pubescence scarcely evi dent. Anterior and middle femora yellow, the upper side more or less piceous, the tibiæ and base piceous. Posterior femora yellow at base, piceous at apex, the colors diagonally separated, the tibiæ and tarsi piceous. Length .20 inch.; 5 mm.

Among the species in the series with elytra more or less blue this may be known by the very distinctly punctate elytra. The colors are very constant; the posterior femora have the colors separated diagonally, so that the underside is more yellow, while the upper is more black.

Occurs in New Mexico and Arizona.

17. **D. mellicollis** Say.—Oval, similar in form and color to *xanthomelæna*. Antennæ half as long as the body, piceous, the three basal joints pale in front, the joints very gradually shorter from the fourth to tenth, eleventh longer. Head blue black between the eyes and posteriorly, front yellow (labrum piceous), a few coarse, deep punctures near each eye. Thorax pale yellow, twice as wide as long, narrowed in front, sides feebly arcuate, margin very narrow, disc regularly convex, extremely finely alutaceous, impunctate. Elytra a little wider at base than the thorax, humeri distinct, but obtuse, umbone not prominent, surface dull blue, very finely alutaceous, and with very indistinct, fine, sparse punctures. Prothorax yellow beneath, metathorax piceous, abdomen piceous at middle, with the apical segment and wide lateral border yellowish, the surface moderately closely punctate, pubescence indistinct. Femora entirely yellow, tibiæ piceous, paler at base, tarsi piceous. Length .18—.20 inch.; 4.5—5 mm.

This species is doubtless mixed with *xanthomelæna* in most collections, due to the hasty aggregation of a number of well defined species under one name. It is remarkable that the description by Say seems to have been lost sight of in our literature, as the same species has been redescribed by LeConte as *semicarbonata*.

From all the preceding species *mellicollis* may be known by the entirely yellow femora. From *politula*, which has a similarly colored head and abdomen, it may, in addition, be known by the almost entire absence of punctuation on the elytra. From *xanthomelæna* and *cervicalis* the color of the head, abdomen and legs will separate it.

Occurs in Louisiana, Texas and Colorado.

18. **D. collata** Fab.—Oval, slightly oblong, subdepressed. Antennæ half as long as the body, piceous, the three basal joints pale beneath. Vertex and occiput black, with faint greenish tinge, front yellow, labrum piceous, a few very coarse punctures close to the eye, others finer, scattered on the vertex. Thorax yellow, immaculate, twice as wide as long, narrowed in front, sides feebly arcuate, margin narrow, surface polished, and, with high power, minutely sparsely punctulate. Elytra not wider at base than the thorax, humeri rounded, umbone not distinct, greenish blue, shining, when seen with high power minutely alutaceous, and with fine, distinct, sparsely placed punctures. Prothorax beneath yellow, metasternum black, abdomen piceous with the last segment and sides broadly yellowish, the surface moderately densely punctured and with quite distinct pubescence. Femora pale yellow, tibiæ at tips and tarsi piceous. Length .16—.18 inch.; 4—4.5 mm.

This is the smallest species at present known in our fauna. The same remarks as under *mellicollis* will separate this species from all which precede. It is not so easily separated from that species, however, by description. It is smaller, more elongate, the elytra are shining blue-green and the punctuation, although very fine, more distinct. This species is, I believe, correctly determined in most cabinets.

Occurs in Georgia and Florida.

HEMIPHRYNUS n. g.

Head oval, inserted as far as the eyes, front nearly vertical, carina and tubercles distinct, clypeus truncate, labrum transverse, arcuate in front. Maxillary palpi not stout, second joint slightly clavate, third as long, obconical, fourth shorter, narrower, conical and acute at tip. Mandibles tridentate at apex, the middle tooth longer. Eyes oval, moderately prominent. Antennæ longer than half the body, filiform, first joint slightly clavate, second nearly half as long, third longer than second, fourth and fifth still longer, joints 6–10 gradually shorter, eleventh as long as fourth. Prothorax transverse, narrowed in front, apex truncate, base broadly arcuate; disc convex, with a vague depression each side close to basal margin. Elytra a little wider at base than the thorax, oblong oval, widest at middle, disc

confusedly punctate. Prosternum very narrow between the coxæ, these oval, prominent and nearly contiguous at their apices, coxal cavities open behind. Mesosternum moderate in length, nearly horizontal. Ventral segments free, the first very little longer than the second. Legs moderate in length. Tibiæ slender, scarcely broader toward apex, the posterior not sulcate but with a very indistinct carina, the terminal spur small; tarsi moderate, the first joint longer, second short, oval, third broadly oval and bilobed, fourth not dilated, the claws broadly appendiculate at base.

The only genus of Halticites as constituted by Chapuis to which this is at all related is Disonycha, and the characters in the preceding table will enable it to be separated. The name above used is in the second half merely commemorative of the genus in which the species has been placed.

It is probable that *Phrynocephu elongata* Jacoby, should be referred to this genus.

H. intermedius Jacoby.—Oval, slightly oblong, rather depressed, body beneath piceous; head, antennæ, thorax and legs reddish yellow, elytra dull green. Head rather coarsely and closely punctate, except at middle. Thorax nearly twice as wide as long, narrowed in front, sides arcuate, anterior angles very obtusely dentiform, disc not very convex, somewhat irregular, a vague, shallow depression at base each side of middle, sometimes a transverse, vague, depression uniting them, surface alutaceous, subopaque, the punctures moderate in size and rather closely placed, less distinct in front. Elytra dull green, surface alutaceous, the punctuation fine and very indistinct. Abdomen shining, slightly pubescent, coarsely sparsely punctate. Length .16—.20 inch.; 4—5 mm.

The male has the first joint of the anterior tarsus moderately dilated. The last ventral segment is broadly emarginate at middle, the pygidium convex, inflexed and filling the emargination. The last ventral of the female is truncate at apex.

This insect has a certain amount of resemblance to the Disonychæ with unicolored elytra.

Occurs in southern Arizona.

Group VII.—MNIOPHILÆ.

Form orbicular or hemispherical. Head deeply inserted. Anterior coxal cavities open behind. Mesosternum very short, or almost entirely concealed by the close approximation of the pro- and metasterna. Antennæ 11-jointed. Posterior tibiæ with a short spur. Claws broadly appendiculate at base. Prothorax without ante-basal impression and usually without the lateral longitudinal impression.

The genera of this group are not numerous, and two only have representation in our fauna, separated as follows:

Antennæ gradually clavate; epipleural fold of elytra vertical....**Argopistes.**
Antennæ slender, but slightly thickened externally; epipleural fold horizontal. **Sphæroderma.**

ARGOPISTES Motsch.

Head rather deeply inserted, the front oblique, inflexed, distinctly carinate, the callosities distinct, but oblique. Clypeus truncate, labrum moderately prominent, truncate. Maxillary palpi moderate in length, the second joint elongate, clavate, third half as long, obconical, fourth slender and longer, acuminate. Antennæ but little longer than half the body, first joint moderately long, 2–3–4 more slender, together as long as the first, the following joints forming a club with the joints broader than the preceding, and of nearly equal length among themselves. Eyes large, slightly reniform, rather narrowly separated on the vertex. Thorax transverse, deeply emarginate in front, anterior angles obtuse, the posterior well defined. Scutellum small, narrowly triangular. Elytra slightly wider at base than the thorax, humeri obtusely rounded, no distinct umbone, punctuation confused, epipleural border vertical. Legs rather short, posterior femora rather widely dilated; the tibiæ broader toward apex, the posterior tibiæ grooved on the outer edge, the borders of the groove finely spinulose, the apex with a small spur. Tarsi moderate, the first joint of posterior pair rather longer than the others combined. Claws rather broadly appendiculate. Pl. VII, fig. 15.

In this genus the eyes occupy a large part of the head and so closely placed that the antennæ are inserted close to their border in a slight emargination, the granulation is rather fine and the surface smooth.

But one species is known in our fauna.

A. scyrtoides Lec.—Orbicular, convex, piceous, black, shining, a broad, arcuate, transverse band on the thorax, a large triangular spot on each elytron, also the apex, red. Head reddish, obsoletely punctate. Antennæ pale rufotestaceous. Thorax more than twice as wide as long, very much narrowed to the front, sides feebly, base very broadly arcuate, surface distinctly alutaceous, finely and rather closely punctate. Elytra rather more finely punctate than the thorax. Body beneath and legs pale rufotestaceous. Length .12—.14 inch.; 3—3.5 mm. Pl. VII, fig. 4.

The male has the last ventral sinuate each side, the median lobe moderately prominent and with a small, moderately deep fovea near the margin.

At first sight this insect is very like an Exochomus. The arcuate red band on the thorax is absent in some specimens; the red spot on each elytron is in the form of a right angled triangle, the base slightly behind the middle, the perpendicular is toward the sides, while the hypothenuse is to the front. The spots meet at the suture. The apex is also bordered with red as in some Scymnus.

Occurs in Biscayne Bay, Florida. It is remarkable that the other species of the genus occur in the Amur region and Japan.

SPHÆRODERMA Steph.

Head triangular, deeply inserted in the thorax, front obtusely carinate, the callosities small, clypeus truncate, labrum feebly emarginate at middle. Maxillary palpi with second joint slender, third short, obconical, fourth a little longer, acute. Eyes moderately prominent, round. Antennæ half as long as the body, slightly thicker toward tip, first joint slightly clavate, second and third equal, together as long as the first, 4–10 nearly equal, gradually wider, eleventh longer, acuminate at tip. Thorax transverse, anterior angles rounded, the posterior obtuse, margin narrowly explanate. Elytra not wider at base than the thorax, punctuation generally confused, substriate in places, epipleuræ horizontal. Legs moderate, hind thighs broadly oval. The tibiæ broader at apex, the posterior grooved on the outer face near the apex and with a small terminal spur, and distinctly prolonged on the inner side beyond the insertion of the tarsus. First joint of hind tarsi as long as the following together, the claws broadly appendiculate at base. Pl. VII, fig. 10.

The form of the posterior tibia partake of the characters of Chætocnema and Psylliodes, *i. e.*, there is a slight sinuation near the apex limited above by an indistinct angulation, and the tibia is prolonged on the inner side beyond the insertion of the tarsus. The latter character is not mentioned by Chapuis, and may probably differentiate our species generally from the old world forms.

One species is known in our fauna.

S. opima Lec.—Orbicular, convex, piceous black, shining, front of head a little paler. Antennæ slender, pale rufotestaceous. Head closely punctate. Thorax more than twice as wide as long, rapidly narrowed in front, the sides nearly straight, rounded at the front angles, finely, moderately, closely punctate. Elytra not wider at base than the thorax, humeri broadly rounded, umbone feeble, the disc with coarse not close punctures forming rather irregular striæ at middle, but quite regular at the sides, intervals more finely punctulate. Epipleuræ paler. Body beneath piceous, tibiæ and tarsi reddish brown. Length .10 inch.; 2.5 mm.

The males of this genus are said to have the first joint of all the tarsi broader than in the female and the front tibia also broader.

This insect is very like *Scirtes tibialis* in form and color. It varies in color to piceous brown with the underside and legs pale; this is due probably to immaturity.

Occurs in Illinois, North Carolina and Texas.

Group VIII.—HALTICÆ.

Antennæ 11-jointed. Thorax regularly arcuate at base, with distinct ante-basal line variable in distinctness, not limited at its extremities by a longitudinal plica. Posterior tibiæ with, at most, a very slight sulcus on the posterior edge near the apex. Anterior coxal cavities open behind. Claw joint of posterior tarsi slender, claws appendiculate.

This group is nearly parallel with the Halticites as defined by Chapuis, and in our fauna is represented by Haltica alone. Several species had been referred to Cæporis by LeConte, which, however, do not possess the essential character of that genus.

HALTICA Geoffr.

Head short, usually deeply inserted, front regularly declivous, the interocular carina never very prominent, the tubercles usually feebly marked. Antennæ half as long as the body, joints 2–3–4 gradually longer, except in *rufa*. Labrum small. Maxillary palpi short, rather stout, the terminal joint short and conical. Thorax usually one-half wider than long and broadest at base, and with a more or less distinct ante-basal impressed line, base arcuate, lateral margin more or less thickened at the front angles. Elytra usually a little wider at base than the thorax, the punctuation of surface confused. Prosternum rather narrow between the coxæ, the coxal cavities open behind, angulate externally. Legs moderately long, tibiæ of posterior legs not or feebly sulcate, terminated by a small spur. Tarsi moderate in length, claws with a broad dilatation at base.

From the above description it will be observed that the differences between Haltica and Disonycha are very feeble and may be narrowed down to the form of the base of the thorax and the presence of a line more or less impressed in Haltica.

The character of the impressed line affords a means of grouping the species, but must be used with care and not too strictly interpreted. In other words, very little can be done with the species from

a very few specimens. In *carinata*, for instance, the impression is usually deep and ends very abruptly, but specimens occur with the line as entire as in *chalybea*. One of our species has the line terminating in a fovea at each end. Color has scarcely any value in the separation of species and can only be used in the most general way as in *ignita* the color runs from bright golden to deep blue.

The sexual characters afford useful means for separating a certain number of very closely allied species of rather slender form placed at the end of the genus.

Among the species included in Haltica are two—*nana* and *Burgessi*—which form the genus Micraltica of the Class. Col. N. A. 1883, p. 352. This genus made part of the group Crepidoderæ, but as both of the species have open anterior coxal cavities they cannot remain in that group, and no course remains but to place them in Haltica, where Crotch placed one of them.

The genus is a difficult one, and the species can never be determined with any degree of certainty without a fair number of specimens, some of which must be males. Unfortunately, this sex is much less abundant than the females.

To assist students in the determination of species the following table has been prepared, but it must never be relied upon to the exclusion of the descriptions, or at least the tabular determination must be verified by reference to the description:

Body above blue, bronze, green, or cupreous, more or less metallic (head and thorax reddish yellow in two species).....2.

Body above reddish yellow, broadly oval.....13.

2.—Elytra longitudinally plicate at the sides.....1. **bimarginata.**

Elytra not plicate.....3.

3.—Antennæ and legs in great part yellow, in striking contrast with the color of the upper surface.....12.

Antennæ and legs piceous, more or less metallic.....4.

4.—Thorax with a deep ante-basal groove which extends *completely* across the thorax.....5.

Thorax with a moderate, sometimes obsolete ante-basal groove which is never entire.....6.

5.—Large species (5.5 mm.), usually blue, form robust, thorax very distinctly wider at base.....2. **chalybea.**

Smaller species (2—3 mm.), of more elongate form, thorax scarcely wider at base.

Surface metallic blue, humeri scarcely evident, elytra rather coarsely and closely punctate; legs brown; species quite small.....3. **nana.**

Surface distinctly metallic, brassy, green, blue or bronze, elytral punctuation distinct.....4. **ignita.**

Surface not metallic, brownish testaceous, antennæ pale, legs colored as upper surface; elytra less distinctly punctate..... ignita var.

6.—Transverse impression of thorax deep, humeral angles of elytra well marked, a depression within the umbone.....7.

Transverse impression feeble or nearly absent; humeral angles of elytra rounded .....10.

7.—Transverse impression terminating at either end in a fovea; form rather short, as in *ignita*.....9. **evicta.**

Transverse impression gradually evanescent at its extremities.....8.

8.—Larger species, thorax barely wider at base than apex; last ventral ♂ with a deep longitudinal impressed line.

Brilliant cupreous, with violet or purplish reflections.....6. **carinata.**

Blue, head more prominent, form more robust .....5. **vicaria.**

Smaller species of the form of *ignita*, thorax distinctly wider at base; last ventral of ♂ with at most a slight concavity.....9.

9.—Thorax not visibly punctate, elytra relatively coarsely punctate; cupreo-æneous .....12 **amœna.**

Thorax alutaceous and finely punctulate, elytra alutaceous and finely punctulate, with a scabrous aspect; greenish bronze .....10. **æruginosa.**

Thorax quite coarsely punctate, elytra with coarse punctures and finer intermixed; cupreo-æneous.....11. **obolina.**

10.—Species of robust facies and rather large size.

Moderately shining, punctuation indistinct, frontal carina and tubercles feeble.....7. **californica.**

Subopaque, punctuation evident, frontal tubercles and carina well marked. 8. **obliterata.**

Species oblong, not very convex, the form recalling that of many *Luperus*..11.

11.—Antennæ slightly compressed, apparently thicker externally, the fourth joint obviously longer than third.

Brownish bronze, last ventral ♂ with a long, but shallow median impressed line; elytra very distinctly punctate.....14. **tombacina.**

Blue, last ventral ♂ with a very deep impression extending half the length of segment; elytra finely moderately punctate. 13. **marevagans.**

Antennæ slender, not thicker externally, the fourth joint equal to or scarcely perceptibly longer than third.

Last ventral ♂ with a deep longitudinal impression extending from apex half to base; elytra indistinctly punctulate.....16. **punctipennis.**

Last ventral ♂ flattened near apex, a feeble longitudinal impression, sometimes merely a smooth line; elytra scarcely visibly punctate. 18. **foliacea.**

Last ventral ♂ as in *foliacea*, elytra relatively coarsely punctate. 15. **tincta.**

Last ventral ♂ not flattened, a feeble impression near the apex; elytra scarcely visibly punctate.....17. **lazulina.**

12.—Entire upper surface uniform in color and with metallic lustre.

Thoracic impression fine, but well marked.

Thorax not wider at base than apex; abdomen and hind femora piceous. 20. **fuscoænea.**

Thorax distinctly wider at base; abdomen rufotestaceous, legs entirely pale.....19. **polita.**

Thoracic impression almost entirely obliterated, thorax wider at base, elytra sparsely punctate, color violaceous. .....21. **opulenta.**

Head and thorax reddish yellow; elytra blue.

Thoracic impression rather feeble; elytra not shining...22. **floridana.**

Thoracic impression deep and entire; elytra rather brilliantly metallic. 23. **Burgessi.**

13.—Form rather broadly oval; thoracic impression almost obliterated; body beneath brown; legs, except at base, black; elytra smooth...24. **rufa.**

1. **H. bimarginata** Say.—Oblong, subparallel, above blue, or slightly bronzed, usually moderately shining, sometimes subopaque. Antennæ half as long as the body, piceous, joints 2–3–4 gradually increasing in length. Head feebly shining, frontal carina obtuse, tubercles usually well marked, a few punctures extending across the head above the tubercles and near the eyes. Thorax one-half wider than long, slightly narrower in front, sides feebly arcuate, the margin very narrow, disc moderately convex, the ante-basal transverse depression rather deep, slightly sinuous at middle, reaching the sides and joining the marginal depression, surface distinctly alutaceous, sparsely punctate, punctures more distinct near the apex and front angles. Elytra distinctly wider at base than the thorax, humeri distinct, umbone moderately prominent and with a slight depression within it, a prominent lateral plica begins at the umbone extends parallel with the margin, curves toward the suture near the apex, surface alutaceous, the punctures fine and indistinct, not closely placed. Body beneath and legs blue-black, shining, abdomen sparsely, indistinctly punctate. Length .20—.24 inch.; 5—6 mm.

As might be expected, an insect distributed over such a wide extent of country exhibits some variation. The color is usually a moderately bright cobalt-blue, but in the mountainous regions of California specimens with a bronzed surface are quite common. While the surface is usually shining, specimens are occasionally seen, especially from Texas, with the surface subopaque. The ante-basal thoracic groove may vary in depth, but is always entire. The lateral plica, while usually prominent, is sometimes feebly so, in the former case reaching, by incurving, nearly to the suture, and in the latter scarcely curved at all. In some feebly developed individuals from the vicinity of San Francisco the plica is almost entirely obliterated and without the abundance of other specimens would be difficult to identify. The lateral plica will enable this species to be separated from all the others in our fauna.

Mr. D. W. Coquillett, of Los Angeles, informs me that this species in all stages feeds on the leaves of Alder (*Alnus*).

Occurs in the entire northern portion of the continent as far south as Pennsylvania, thence westwardly extending in the western plains to Texas and Arizona, and on the Pacific slope from Alaska to Mexico.

2. **H. chalybea** Illig.—Oval, of moderately robust facies, color usually metallic shining blue, rarely cupreous or greenish. Antennæ half as long as the body, piceous, the basal half with metallic lustre, joints 2-3-4 gradually longer. Head smooth, slightly roughened near the eyes, frontal carina rather acute, the tubercles small, oblique. Thorax a little more than half wider than long, narrowed in front, sides arcuate, margin narrow, slightly thickened in front, disc convex, the ante-basal impressed line rather deep and extending from margin to margin, surface with extremely minute scattered punctures. Elytra scarcely wider at base than the thorax, humeri rounded, umbone moderately prominent, smooth, limited within by a slight depression, surface sparsely punctate, nearly smooth near apex. Body beneath and legs blue-black, moderately shining, abdomen sparsely punctate. Length .16—.20 inch.; 4—5 mm.

The variations from the usual blue color in this species seem very rare; for a cupreous specimen from Florida and a greenish one from Detroit I am indebted to Mr. E. A. Schwarz.

The thoracic impressed line is quite constant in its depth and extent, consequently there will be no great difficulty in distinguishing this from the other robust species, *californica*, *obliterata* and *vicaria*, all of which have the impression feeble, although in some of *carinata* it is moderately deep and nearly entire. The latter species has the thorax distinctly narrower than the elytra and a more prominent head.

The next species is the only other one with the impression entire, but this is smaller, more depressed and more evidently punctate.

Occurs from New England States and Michigan to Florida and Texas.

3. **H. nana** Crotch.—Oblong oval, convex, metallic blue or bluish green, shining. Antennæ as long as half the body, slender, joints 2-4 equal in length, outer joints piceous, basal four joints pale. Head smooth, frontal carina moderately prominent, acute, tubercles feeble and flat. Thorax one-third wider than long, narrowed at apex, sides arcuate, disc convex, sparsely indistinctly punctate, the ante-basal impression deep, sharply impressed and extending from side to side. Elytra scarcely wider at base than the thorax, humeri rounded, umbone scarcely prominent, a distinct depression at base within it, disc convex, the punctuation relatively very coarse, deep and close, but smoother toward the apex. Body beneath piceous, shining; abdomen sparsely punctate. Legs brownish testaceous, posterior femora piceous. Length .08 inch.; 2 mm.

The last ventral of the male has a deep semi-oval impression, which extends nearly half the length of the segment.

It is difficult to place this species in any tabular arrangement. The legs being in great part pale it might be associated with *polita* et al., but the short, robust form and the deep and entire ante-basal impression indicate its relationship with *ignita* and *chalybea*. It is the smallest species in our fauna, smaller than many Phyllotreta. It was described as a Crepidodera by Crotch, but the open anterior coxal cavities forbid such a reference. Later on we supposed it related to Cæporis, but the absence of tibial spurs to the front and middle legs forbids this reference. It is evidently merely a small Haltica.

Occurs from South Carolina to Florida.

4. **H. ignita** Illig.—Oval, slightly oblong, subdepressed, surface shining, variable in color from a coppery golden lustre through greenish to blue. Antennæ half as long as the body, piceous, joints 2–3–4 gradually longer. Head smooth, an arcuate depression within each eye, frontal carina acute, tubercles distinct, but small. Thorax one-half wider than long, very little narrowed in front, sides feebly arcuate, disc convex, the ante-basal impression deep, extending entirely across the thorax from side to side, surface very minutely sparsely punctate. Elytra distinctly wider at base than the thorax, humeri prominent, but obtuse, umbone also moderately prominent, smooth, distinctly limited within by a depression, surface distinctly sparsely punctate near the base, gradually smoother to apex. Body beneath and legs colored as above; abdomen alutaceous, sparsely punctate. Length .12—.16 inch.; 3—4 mm.

In the males the last ventral segment is sinuate each side, the middle forming a short semi-circular lobe, which is flat, with the extreme edge often slightly reflexed.

The variations in color in this species are very striking. As a general rule the more northern habitats—Hudson's Bay to Pennsylvania—furnish the more brilliant golden specimens, the further south these become rarer, and the green, and finally the deep blue, become the characteristic colors in the Gulf States.

As a general rule the northern specimens are larger than the southern. The ante-basal groove varies in depth, although in the great majority it is deep and entire; the sculpture of the elytra also varies in distinctness.

A form has been collected at Crescent City, Florida, in which the general color is brownish with scarcely any trace of metallic lustre and with the antennæ and legs of correspondingly pale color; the sculpture is generally fainter than in the northern forms, yet preserving the intermixed character which seems peculiar to the species.

That the species here described is that intended by Illiger can hardly be doubted from the greater part of the description as well as from the Melsheimer tradition, but in the Illiger description he concludes: "*plica submarginali*," a character possessed by no species in our fauna, except *bimarginata*. Without attempting to explain the disagreement, the fact is noted to show that it has not been overlooked. I have no doubt that the insect which has, for more than fifty years, borne this name is the true species.

Occurs from the Hudson's Bay region to New England States south to Texas and Florida.

5. **H. vicaria** n. sp.—Elongate oval, much narrowed in front, not very convex, deep blue, moderately shining. Antennæ longer than half the body, piceous, basal joints bluish, joints 2–3–4 gradually longer. Head coarsely punctured near the eyes, frontal carina prominent, tubercles rather feeble. Thorax about one-third wider than long, scarcely narrowed in front, sides arcuate, margin narrow, slightly thickened at the front angles, disc convex, ante-basal impression moderately deep, but not sharply impressed, usually gradually evanescent at its ends, surface finely alutaceous, finely punctate, punctures a little coarser near the sides and front angles. Elytra distinctly wider at base than the thorax, humeri obtuse, umbone moderate, a slight impression within it, surface very finely alutaceous, moderately closely punctate, but smoother near the apex. Body beneath and legs colored as above; abdomen indistinctly punctate. Length .18—.24 inch.; 4.5—6 mm.

The male has a sinuation each side of the middle of the last ventral, the median lobe semi-circular, flattened, with a deep longitudinal impression extending the entire length of the segment, finer in front.

From the fact that the thorax has the base and apex nearly equal, the species has the facies of having a relatively smaller thorax than any other and the humeri are consequently more prominent. The punctuation is as close as in *carinata*, but less coarse. By the well defined, but not entire ante-basal impressed line this species may be distinguished from any of the large blue forms.

Occurs from Massachusetts (Blanchard) to Florida, westward to Colorado and Arizona.

6. **H. carinata** Germ.—Oblong oval, subdepressed, bright coppery red with bluish or purplish reflections, shining. Antennæ half as long as the body, piceous, the basal half somewhat æneous, joints 2–3–4 gradually longer. Head nearly smooth, a transverse row of punctures between the eyes, carina feeble tubercles small. Thorax about one third wider than long, scarcely narrowed in front, sides slightly arcuate, margin narrow, thickened at the front angles, disc convex, ante-basal impression moderately deep at middle, gradually evanescent toward the sides, surface relatively coarsely, but not closely punctate. Elytra a little wider at base than the thorax, humeri obtuse, feebly prominent, a slight

impression within it, surface more coarsely and closely punctate than the thorax. Body beneath colored as above, slightly greenish at the sides: abdomen moderately, coarsely and closely punctate. Length .14—.18 inch.; 3.5—4.5 mm.

This is one of the most easily known species in our fauna by the striking colors and the relatively coarse punctuation, which is, however, variable in degree. The thoracic impression also varies in depth, although at all times sharply defined and usually gradually evanescent at its extremities.

The male has a sinuation of the last ventral on each side, the intermediate lobe is semi-circular and has a sharply defined, impressed, median line, which extends half the length of the segment.

In the forms which occur in the Middle States region the color is more decidedly blue, but there can always be seen the tendency to cupreous or violaceous bicoloration.

One of our most widely distributed species, and consequently showing a tendency to vary locally. The form described by LeConte as *torquata*, from two individuals, has the thoracic impression rather less impressed, but otherwise shows no important difference from the large series examined.

Occurs from Bennington County, Vt., (Roberts) southward to Pennsylvania, thence west to the entire Pacific region and Arizona.

From Los Angeles Mr. D. W. Coquillett writes that it injures the grape vines by eating the leaves.

7. **H. californica** Mann.—Short oval, convex, facies robust, shining blue. Antennæ half as long as the body, piceous, basal joints bluish, joints 2–3–4 gradually longer. Head shining, with a few scattered punctures, frontal carina obtuse, tubercles small and indistinct. Thorax one-half wider than long, narrowed in front, sides regularly arcuate, margin very narrow, disc convex, ante-basal groove obliterated at middle, faintly visible at sides only, surface sparsely, finely punctate with an oblique series of coarser punctures beginning at the front angles. Elytra not wider at the base than the thorax, humeri rounded, umbone feeble, smooth, surface with very indistinct, sparse punctuation, smooth at apex and sides. Body beneath and legs bluish; abdomen sparsely punctate. Length .18 inch.; 4.5 mm.

This species has much the form, color and general appearance of *Gastrophysa cyanea*. From the other robust blue species it is best distinguished by the characters of the table. It is very closely related to *obliterata*, but the shining surface and shorter form will readily distinguish it.

One female (from Mannerheim), California.

8. **H. obliterata** Lec.—Oblong oval, convex and moderately robust, color subopaque, blue. Antennæ piceous, with slight metallic lustre, a little longer than half the body, joints 2-3-4 gradually longer. Head finely alutaceous, a group of coarse deep punctures near each eye, frontal carina obtuse, tubercles small. Thorax one half longer than wide, narrowed in front, sides arcuate, more strongly anteriorly, margin very narrow, slightly thickened at the front angles, disc convex, ante-basal impression almost entirely obliterated, visible at times only near the sides, surface subopaque, finely alutaceous, minutely and rather closely punctulate, an oblique series of slightly larger punctures beginning at the front angles. Elytra not wider at base than the thorax, humeri obliterated, umbone scarcely distinct, a slight flattening within it, surface subopaque, finely and rather closely punctulate, a little more coarsely near the base. Body beneath and legs colored as above; abdomen moderately closely punctate. Length .18—.26 inch.; 4.5—6.5 mm.

The male has the last ventral sinuate each side, the median semicircular lobe short, flattened, smoother, the apical edge slightly reflexed.

This species is one of the largest in our fauna. It is especially known by the opaque blue color, convex and robust form, and almost entire obliteration of the ante-basal impression.

Occurs in Arizona and New Mexico.

9. **H. evicta** Lec.—Oblong oval, subdepressed, brassy bronze, shining. Antennæ a little longer than half the body, piceous, bronzed near the base, joints 2-3-4 gradually longer. Head smooth posteriorly, rugulose near the eyes, frontal carina moderately prominent, the tubercles not separated by the usual line. Thorax one-half wider than long, narrowed in front, sides arcuate, margin narrow, distinctly thickened at the front angles, disc moderately convex, the ante-basal impression fine, but well impressed, terminating at each end in a fovea extending toward the base, surface distinctly alutaceous, finely sparsely punctate, a little more coarsely near the sides and base. Elytra distinctly wider at base than the thorax, humeri obtuse, umbone moderately prominent, a distinct depression within it, surface shining, finely punctate, more closely at base and along the suture, smoother at sides and apex. Body beneath and legs colored as above; abdomen rather coarsely sparsely punctate. Length .18 inch.; 4.5 mm.

The last ventral of male is very slightly sinuate each side, at middle subtruncate, a vague, longitudinal, smoother impression.

At first glance this species is very like *Phyllodecta vulgatissima* in form and color. It is the only species at present known in our fauna with the ante-basal groove terminating in a fovea at each end.

Occurs in Oregon.

10. **H. æruginosa** Lec.—Oval, slightly oblong, feebly convex, greenish bronze, feebly shining. Antennæ a little longer than half the body, piceous, slightly bronzed at base, joints 2-3-4 gradually longer. Head subopaque, alutaceous, a few large punctures near the eyes, frontal carina very obtuse, tubercles small. Thorax a little more than half wider than long, narrower in front, sides

arcuate, margin narrow, slightly thickened at the front angles, disc convex, ante-basal impression broad, shallow and indistinct at middle, a little deeper near the sides, then gradually evanescent, surface alutaceous, subopaque, sparsely punctulate, punctures a little coarser near the front angles. Elytra wider than the thorax, humeri rounded, umbone moderate, a slight impression within it, surface subopaque, alutaceous, finely and moderately closely punctate, so as to appear somewhat scabrous. Body beneath more shining than above, very sparsely punctate. Length .12—.14 inch.; 3—3.5 mm.

The last ventral of male has a slight sinuation each side, the middle lobe short, flat and with a median smooth space.

This species is also similar in form to *ignita*, but differs in the ante-basal groove of the thorax and the style of surface sculpture.

Occurs in California and Oregon.

11. **H. obolina** Lec.—Oval, slightly oblong, narrower in front, not very convex, brilliant cupreo-æneous. Antennæ brownish, half as long as the body, joints 2-3-4 gradually longer. Head smooth, a few coarse punctures in a depression near the eyes, frontal carina moderate, the tubercles not separated by the usual median line. Thorax more than half wider than long, narrowed in front, sides regularly arcuate, margin narrow, a little thickened at the front angle; disc convex, ante-basal line broadly impressed and shallow, gradually evanescent, surface shining, sparsely finely punctate. Elytra a little wider at base than the thorax, humeri obliquely rounded, umbone scarcely prominent, surface shining, punctuation moderately coarse, but not close, with finer punctures intermixed. Body beneath colored as above; abdomen with coarse, sparse punctures. Length .12—.14 inch.; 3—3.5 mm.

The six specimens before me are all females. This species has quite the form and facies of the more brilliant forms of *ignita*, and the elytral punctuation is similar, except that in *ignita* the intermediate finer punctures have not been observed. The entire form of *obolina* is broader than in *amœna*, although not very different from *æruginosa*, which has a different color and surface sculpture.

Occurs in northern California and Nevada.

12. **H. amœna** n. sp.—Oblong oval, moderately convex, cupreo-æneous, shining. Antennæ slightly longer than the body, fuscous, joints 2-3-4 gradually longer. Head smooth, frontal carina moderately prominent, tubercles distinct, oblong. Thorax one third wider than long, distinctly narrowed in front, sides arcuate, margin narrow, distinctly thickened near the front angles, disc convex, ante-basal impression sharply defined, but gradually evanescent at its extremities, surface shining, not visibly punctulate, except with very high power. Elytra a little wider than the thorax, humeri obliquely rounded, umbone feeble, surface very finely alutaceous, relatively coarsely, but not closely punctate, the punctures at apex nearly as coarse as at base. Body beneath colored as above; abdomen moderately closely punctate. Length .12 inch.; 3 mm.

The last ventral of the male is slightly sinuate each side, the middle lobe flattened and with a smooth line along the middle, which, by reflected light, gives the appearance of a depression.

A small, inconspicuous species of the form nearly of *polita*. The characters in the analytical table give its distinctive points more clearly than can be done by comparison.

One male specimen, Georgia.

13. **H. marevagans** n sp.—Oval, slightly oblong, moderately convex, deep blue, rarely slightly greenish, shining. Antennæ half as long as the body, obviously thicker externally, piceous, bluish at base, joint four distinctly longer than third and equal to fifth. Head smooth, frontal carina scarcely prominent, the tubercles flat and indistinct. Thorax more than half wider than long, sides arcuately narrowed to the front, margin very narrow, slightly thickened at front angles, disc convex, ante-basal impression extremely indistinct, often entirely obliterated, surface sparsely, finely punctate near the base, an oblique series of coarser punctures beginning at the front angles. Elytra a little wider at base than the thorax, humeri rounded, umbone feeble, a slight flattening within it, surface finely, but very distinctly punctate, not closely, smoother near the apex. Body beneath and legs colored as above; abdomen coarsely, not closely punctate. Length .16—.18 inch.; 4—4.5 mm.

The last ventral of the male has a very distinct sinuation each side, the middle lobe flat, with a deep longitudinal impression extending half the segment and ending abruptly.

In most of the collections examined this species is labelled *foliacea*, from which it differs in form, sculpture and male characters.

Occurs along the sea-coast region from Florida to New Jersey, and probably farther north.

14. **H. tombacina** Mann.—Oval, slightly oblong, moderately convex, brownish cupreo æneous, moderately shining. Antennæ half as long as the body, slightly thicker toward the tip, piceous, æneous at base, joints 2-3-4 gradually longer. Head smooth behind, a group of very coarse punctures near each eye, frontal carina feeble, tubercles distinct, flat, separated by an impressed line. Thorax one-half longer than wide, slightly narrowed in front, sides feebly arcuate, margin very narrow, slightly thickened at apical angles, disc convex, ante basal line finely impressed, gradually evanescent at the sides, surface extremely finely sparsely punctate, an oblique series of slightly coarser punctures near the front angles. Elytra slightly wider at base than the thorax, humeri rounded, umbone feeble, a slight impression within it, surface finely sparsely punctate, smoother near the apex. Body beneath piceous, faintly metallic; abdomen very sparsely punctate. Length .16—.20 inch.; 4—5 mm.

The last ventral of the male is sinuate each side, the median lobe moderately prominent, slightly concave and smooth with a longitudinal, not deep, impression extending three-fourths the length of the segment.

While this species corresponds very well with the insufficient description by Mannerheim, there may be some doubt as to whether the name should be applied to this or to *evicta*. For a number of years it has had the unpublished name *cupreolus* in the LeConte cabinet and may have been distributed under that name.

This species and *marevagans* are a little stouter than the following species, the antennæ thicker toward the tip, although not greatly so, and the fourth antennal joint very plainly longer than the third, but the entire series is so difficult to separate by description that the sexual characters of the male, together with the elytral sculpture must be especially depended upon. In all the species none approach it in color in any of their variations, except *evicta*, which is easily known by the foveate ante-basal line.

Occurs in California and Montana, also in Alaska (Mannerheim).

15. **H. tincta** Lec.—Elongate oval, feebly convex, nearly of the form of *carinata*, deep blue to nearly black, moderately shining. Antennæ slender, a little longer than half the body, piceous, bluish at base, third and fourth joints equal in length. Head distinctly transversely impressed above the tubercles, these small, distinctly separated, carina not prominent. Thorax more than half wider than long, distinctly narrower in front, sides arcuate, more broadly anteriorly, margin very narrow, distinctly thickened at the front angles, disc convex, ante-basal line moderately deeply impressed, ending rather abruptly near the sides, surface sparsely, finely punctate, a little more coarsely at base, a few coarse punctures near the front angles. Elytra a little wider at base than the thorax, humeri rounded, umbone feeble, a slight impression within it, surface moderately, coarsely and closely punctate, smoother near the apex. Body beneath and legs colored as above; abdomen sparsely, coarsely punctate. Length .16—.18 inch.; 4—4.5 mm.

The last ventral of the male is slightly sinuate each side, the middle lobe moderately prominent, with a concavity of triangular form.

Among the species of slender Luperoid form this one is sufficiently well marked by the relatively coarse punctuation of the elytra.

Occurs in California, Oregon, Nevada and Montana.

16. **H. punctipennis** Lec.—Elongate oval, of rather slender form, feebly convex, bright greenish, moderately shining. Antennæ slender, a little longer than half the body, piceous, greenish at base, fourth joint scarcely longer than the third. Head smooth, a group of coarse punctures near each eye, tubercles feeble, carina moderately prominent, but obtuse. Thorax one-half wider than long, narrowed in front, sides regularly arcuate, margin narrow, slightly thickened in front, disc convex, ante-basal impression very feebly indicated or almost entirely obsolete, surface very finely alutaceous, very minutely, sparsely punctulate, punctures a little larger near the sides. Elytra scarcely wider at base than the thorax, humeri rounded, umbone scarcely distinct, surface alutaceous, minutely sparsely punctate, smoother near apex. Body beneath colored as above; abdomen distinctly punctate. Length .14—.18 inch.; 3.5—4.5 mm.

The last ventral of male is sinuate each side, the middle lobe short, semi-circular, the margin reflexed; surface flat, with a short, deep, longitudinal impression near apex.

This species closely resembles *foliacea*, but has the elytra a little more distinctly punctate. The male characters afford the only sure means of separating them.

Occurs in Missouri, Kansas, Colorado and California.

17. **H. lazulina** Lec.—Elongate oval, feebly convex, bright blue or bluish green, shining. Antennæ a little longer than half the body, piceous, bluish at base, third and fourth joints equal. Head smooth posteriorly, a few coarse punctures near the eyes, a transverse impression above the tubercles, which are small, the carina obtuse. Thorax one-half longer than wide, narrower in front, sides arcuate, margin narrow, distinctly thicker at apex, disc convex, ante-basal impression fine, feebly impressed, evanescent at the sides, surface alutaceous, distinctly and moderately closely punctulate, an oblique series of coarse punctures near the front angles. Elytra scarcely wider at base than the thorax, humeri rounded, umbone not distinct, surface sparsely finely punctate, smoother at apex. Body beneath as above; abdomen with few punctures. Length .14—.18 inch.; 3.5—4.5 mm.

Last ventral of male sinuate each side, median lobe not prominent, flat, smooth at middle, an extremely short and shallow impression near apex.

Closely resembling *tincta*, but less distinctly punctured and with different male characters; *punctipennis* and *foliacea* are less punctate.

Occurs in Colorado, Montana and Washington Territory.

18. **H. foliacea** Lec.—Elongate oval, feebly convex, color variable from bright green to dark blue, shining. Antennæ half as long as the body, slender, piceous, greenish near base, joints three and four equal. Head smooth behind, a group of coarse punctures near the eyes, a feeble transverse impression above the small tubercles, frontal carina obtuse. Thorax more than half wider than long, narrowed in front, the sides feebly arcuate, margin narrow, very slightly thickened at the front angles, disc convex, the ante-basal line almost entirely obliterated, surface alutaceous, distinctly, sparsely punctulate; a little more coarsely near the front angles. Elytra a little wider at base than the thorax, humeri rounded, umbone not prominent, surface alutaceous, sparsely indistinctly punctate, with a finely scabrous aspect. Body beneath as above; abdomen coarsely, not closely punctate. Length .14—.18 inch.; 3.5—4.5 mm.

The last ventral of male is slightly sinuate each side, the middle lobe short, the apical margin reflexed, a slight longitudinal impression near the apex which is often replaced by a smooth space.

The sexual characters are not very unlike those of *lazulina*, but that has the entire surface more distinctly punctate. Injures the grape vine.

Occurs in Texas, New Mexico and Arizona, those from the first two regions are generally of the green color, those from Arizona more generally blue.

19. **H. polita** Oliv.—Elongate oval, scarcely narrower in front, convex, æneous bronze, shining; legs and antennæ rufotestaceous. Antennæ half as long as the body, slender, joints 2-3-4 gradually longer. Head alutaceous, slightly roughened near the eyes, frontal carina moderately prominent, the tubercles distinct. Thorax one-fourth wider than long, narrowed in front, sides regularly arcuate, margin narrow, distinctly thickened at the front angles, disc convex, a feebly impressed ante-basal line extending very nearly across the disc, surface very finely alutaceous. Elytra not wider at base than the thorax, humeri not distinct, umbone scarcely prominent, surface alutaceous, very minutely, sparsely punctulate. Body beneath reddish brown, a faint bronze surface lustre, abdomen alutaceous, distinctly not closely punctulate. Length .16—.18 inch.; 4—4.5 mm.

The male has the last ventral sinuate each side, the middle forming a short, semi-circular lobe, which is triangularly impressed, with a short longitudinal impression near the apex.

The form of this insect is somewhat that of our Psylliodes, there being but a slight angle formed by the sides of the thorax and elytra. This form, together with the pale antennæ and legs, will enable the insect to be recognized.

This is erroneously placed as a synonym of *Systena frontalis* in the "Catalogus."

Occurs in Georgia and the Carolinas.

20. **H. fuscoænea** Mels.—Oblong oval, moderately shining, olivaceous green, antennæ and legs rufotestaceous. Antennæ a little longer than half the body, joints 2-3-4 gradually increasing in length. Head finely alutaceous, a faint transverse groove between the eyes in which are a few indistinct punctures, frontal carina broad and obtuse, the tubercles small. Thorax transversely subquadrate, very little wider than long, not narrower at apex than base, sides very feebly arcuate, margin very narrow, slightly thickened at the front angles, disc convex, the ante-basal impression fine, but moderately deep, extending nearly from side to side, surface finely alutaceous and with very minute, sparse punctures. Elytra not wider at base than the thorax, humeri broadly rounded, umbone not distinct, surface distinctly sparsely punctate near the base, smoother at apex. Body beneath piceous with æneous surface lustre; abdomen sparsely punctate. Legs rufotestaceous, the posterior femora piceous with æneous surface lustre. Length .12—.14 inch.; 3—3.5 mm.

In the male the last ventral is truncate at middle, a slight sinuation each side, the middle at apex flattened, the edge slightly reflexed.

This species has rather the habitus of a Chætocnema than Haltica in general. The nearly square thorax, together with the pale antennæ and legs will enable it to be distinguished from *polita* and all the others of the genus.

Occurs from Massachusetts to Georgia.

21. **H. opulenta** n. sp.—Oval, slightly oblong, moderately robust, cupreo-violaceous, antennæ and legs rufotestaceous. Antennæ half as long as the body, joints 2-3-4 gradually increasing. Head shining, a few scattered, very fine punctures, others coarser near the eyes, frontal carina moderately prominent, tubercles small. Thorax nearly twice as wide at base as long, narrowed in front, sides regularly arcuate, margin extremely narrow, slightly thickened at the front angles, disc convex, ante-basal impression almost entirely obliterated, surface very finely, sparsely punctulate. Elytra not wider at base than the thorax, humeri very broadly rounded, umbone feebly distinct, surface shining, finely, not closely punctulate Body beneath piceous, without metallic lustre; abdomen sparsely punctate. Legs entirely rufotestaceous. Length .16 inch.; 4 mm.

Two female specimens only have been seen. The form is somewhat that of *obliterata*, but a little shorter, while the surface color is that of some of the darker forms of *carinata*.

The very feeble transverse impression of the thorax as well as the form will serve to distinguish this species from any of those with pale antennæ and legs in our fauna.

Occurs in southern Arizona.

22. **H. floridana** n. sp.—Oval, depressed, moderately shining, head, thorax, body beneath and legs reddish yellow, abdomen brown, elytra bluish green. Antennæ half as long as the body, rufotestaceous, the outer joints darker, joints 2-3-4 about equal in length. Head finely alutaceous, a few coarse punctures near the eyes, frontal carina very obtuse, tubercles indistinct. Thorax one-half wider than long, not narrower in front, sides feebly arcuate, anterior angles obliquely truncate, disc feebly convex, ante basal impression very feeble, surface finely alutaceous, sparsely, finely punctate, an oblique series of coarser punctures near the front angles. Elytra not wider at base than the thorax, humeri obliquely rounded, umbone scarcely prominent, smooth; surface alutaceous, sparsely, indistinctly, but relatively coarsely punctate, smoother near the apex. Body beneath reddish yellow, metasternum rather coarsely punctate; abdomen brownish, sparsely punctate. Length .12 inch.; 3 mm.

A small species resembling at first sight some of the smaller forms of *Dibon. collata*. It is easily known among our species by its color. The front angles of the thorax are more distinctly obliquely truncate than in any other in our fauna.

Collected at Biscayne, Florida, by E. A. Schwarz, to whom I am indebted for the female in my possession.

23. **H. Burgessi** Crotch.—Oval, moderately convex, head and thorax reddish yellow, elytra metallic bluish green, shining, abdomen piceous, legs pale reddish yellow. Antennæ pale at base, joints five to eleven brown. Head smooth, frontal carina distinct, but obtuse, tubercles small, but well marked, distinctly limited above by a deep groove. Thorax one-half wider than long, sides arcuately narrowing to the front, ante-basal impression deep, arcuate, extending entirely across the thorax from angle to angle, disc convex, surface smooth, shining. Elytra a little wider at base than the thorax, humeri obtusely rounded, umbone moderately prominent, surface with coarse, deep, moderately closely placed punctures which become fainter toward apex; abdomen piceous, sparsely punctate, each puncture with a very short hair. Length .06—.07 inch.; 1.5—1.75 mm.

The male has the apex of the last ventral flattened and slightly upturned toward the pygidium.

Without an examination of the type it would have been impossible to have determined this insect. It was described by Crotch as a Haltica and placed in the series with closed front coxal cavities; the length was given as .16 inch., while the description, otherwise, is very unsatisfactory. While it is widely separated from *nana*, by the table, it is more closely related to it than any other species by the form of the ante-basal impression and the coarse punctures of the elytra. It is not at all a Cæporis, as we have recently placed it.

Occurs at Key West, Florida.

24. **H. rufa** Illiger.—Oval, broader behind, moderately convex, orange yellow, moderately shining. Antennæ half as long as the body, piceous, third joint distinctly longer than the fourth. Head yellow, labrum black, frontal carina broad and obtuse, tubercles very flat, a few coarse punctures in an arcuate series parallel with the border of the eyes. Thorax nearly twice as wide at base as long, narrowed to the front, sides arcuate, margin very narrow, anterior angles obtuse, a slight sinuation or notch in the margin behind them, posterior angles acute, sometimes slightly prominent, disc convex, ante-basal impression broad and shallow, not entire, surface sparsely, indistinctly punctate. Scutellum black. Elytra a little wider at base than the thorax, humeri rounded, umbone feeble, surface indistinctly, sparsely punctate. Body beneath, except prothorax, piceous; abdomen reddish, varying to piceous, sparsely punctate. Legs piceous, the posterior femora pale beneath and at base. Length .16—.20 inch.; 4—5 mm.

This insect seems to have some trouble in finding a permanent generic resting place. Following the "Catalogus" it is a Disonycha, while a species completely congeneric (and I think also specifically identical) has been described in the "Biologia" as *Lactica scutellaris*. That it cannot be referred to Lactica is evident from the character of the basal impression of the thorax, and the choice is plainly between Disonycha and Haltica. The latter genus has been chosen, because there is a well marked ante-basal depression of the thorax,

which is, however, said to occur in Disonycha, but is not present in any of our species. The posterior edge of the hind tibiæ is scarcely at all sulcate as in the majority of our Halticæ. The genera are, however, so lacking in sharpness of definition in Halticini that in certain cases the position of species is purely opinionative, and this is one of them.

Occurs from Massachusetts to Illinois, Florida and Texas, extending through Mexico to South America.

Group IX.—LACTICÆ.

Antennæ 11-jointed. Thorax with a deep ante-basal groove distinctly limited at its ends usually by being bent abruptly toward the base. Anterior coxal cavities open behind.

These few characters define the tribe, while it otherwise shows considerable variation in its generic membership. The following genera are known in our fauna:

Elytra nearly smooth, the punctuation when present extremely fine and scattered..... **Lactica.**

Elytra coarsely striato-punctate.

Form oval; without erect hairs..... **Diphaulaca.**

Form oblong, parallel; elytra with short hairs arising from interstitial punctures..... **Trichaltica.**

These genera belong to the Asiatic region of our fauna.

LACTICA Erichs.

Head subtriangular, inserted in the thorax as far as the eyes, these oval, slightly emarginate in front, coarsely granulate. Front broadly, obtusely carinate, the tubercles feeble. Labrum transverse, slightly arcuate in front. Maxillary palpi stout, terminal joint acutely conical, shorter than the preceding, which is as broad at apex as long. Antennæ longer than half the body, slender, third joint shorter than fourth, joints 4–10 equal, eleventh very little longer. Thorax transverse, with a deep, transverse, ante-basal impression bent at each end rectangularly to the base, apical margin truncate, base arcuate. Elytra oval, scarcely wider at base than the thorax, the punctuation in our species extremely fine and confused. Prosternum separating the coxæ and slightly prolonged, the cavities open posteriorly. Metasternum oblique. Legs rather slender, the anterior and middle tibiæ bisulcate externally, posterior tibiæ with a short sulcus at apex and a row of ciliæ on the outer side extending

nearly half to base, terminated by a small curved spur. Tarsi more than half the length of the tibiæ, the claws appendiculate.

As represented in our fauna Lactica is certainly very closely related to Haltica, but readily known by the deep basal impression rectangularly recurved at either end.

Two species are known, separable as follows:

Entirely lemon-yellow, tibiæ and tarsi black ..... **tibialis.**
Head and thorax yellow, elytra deep violet blue ..... **Iris.**

L. tibialis Oliv.—Oblong oval, moderately convex, entirely pale yellow, surface shining. Antennæ piceous, two basal joints yellow. Head very sparsely punctulate. Thorax nearly twice as wide at base as long, distinctly narrowed in front, sides arcuate, margin narrowly explanate, front angles very obliquely truncate, disc convex, sparsely, finely punctate. Elytra scarcely wider at base than the thorax, humeri rounded, umbone not prominent, disc moderately convex, not gibbous near the base, punctuation fine, indistinct and moderately close. Body beneath entirely yellow; abdomen moderately closely punctate and sparsely pubescent. Femora yellow, except the upper side of knees, tibiæ and tarsi piceous. Length .14—.16 inch; 3.5—4.5 mm.

The last ventral of male is broadly emarginate at middle, the first joint of anterior tarsus broader than in the female.

This species is often mistaken for *Haltica rufa*, but independently of the deep basal impression, the form is more elongate and the color always paler.

Occurs from North Carolina to Florida and Louisiana.

L. Iris Oliv.—Oval, slightly oblong, moderately convex, shining, head and thorax yellow, elytra deep violet blue. Antennæ piceous, three basal joints pale. Head sparsely, finely punctate, a large foveate puncture near each eye. Thorax twice as wide at base as at apex, narrower in front, sides arcuate, margin very narrow, front angles not obliquely truncate, disc convex, not visibly punctate. Elytra not wider at base than the thorax, humeri rounded, umbone moderately prominent, limited within by a slight depression, disc convex, very slightly gibbous at base, color deep violet-blue, surface shining, scarcely visibly punctate. Prothorax beneath, front and middle legs pale yellow; metasternum, abdomen and hind legs piceous. Abdomen moderately closely punctate on the intermediate segments, sparsely pubescent. Length .14—.16 inch.; 3.5—4 mm.

Males have not been observed.

The contrast in color between the front of body and the elytra make this one of our prettiest Halticides. It seems rather rare.

Occurs in Maryland (Lugger) and Georgia.

DIPHAULACA Clark.

Head inserted in the thorax as far as the eyes, the front obtusely carinate and with distinct tubercles, clypeus slightly emarginate,

labrum slightly arcuate in front, maxillary palpi rather slender, the terminal joint as long as the preceding, acute. Antennæ slender, at least half as long as the body Thorax broader than long, narrower in front, the sides arcuate, anterior angles obliquely truncate (in our species), the ante-basal impression deep, slightly sinuous, limited each side by a short longitudinal impression. Elytra oval, wider at base than the thorax, disc coarsely striato-punctate. Prosternum moderate, slightly dilated at apex, the coxal cavities widely open behind. Legs moderate, tibiæ slightly broader to apex, the outer face slightly grooved near the apex, the posterior pair alone with a small spur. Tarsi moderate in length, the first joint of the posterior pair nearly one-third the length of the tibia. Claws appendiculate.

It is not without some doubt that I refer the small species before me to the present genus, having but one species at hand for comparison (*D. nitida* Jacoby), which is itself abnormal in several respects. The open front coxal cavities, the deep ante-basal impression limited each side by a (very short, it is true) longitudinal impression, the striato-punctate elytra cause me to place it in the Lacticæ and Diphaulaca is the only genus to which it can be referred, unless a new one be made, and this could not be accurately defined.

D. bicolorata n. sp.—Oval, moderately convex, head, thorax and legs reddish yellow, elytra and abdomen piceous black with faint purple lustre. Antennæ rufotestaceous, slightly darker externally. Head smooth. Thorax nearly twice as wide at base as long, narrowed in front, sides arcuate, anterior angles obliquely truncate, disc convex, very sparsely punctate. Elytra wider at base than the thorax, humeri rounded, umbone small, smooth, disc moderately convex, coarsely striato-punctate, punctures closely placed and deep, those near the suture very irregular, although variable in the specimens, intervals smooth, metasternum and abdomen piceous black, shining, the latter sparsely punctate. Legs pale rufotestaceous, the posterior femora slightly darker. Length .08 inch.; 2 mm.

The elytral punctuation is distinctly variable in the four specimens before me, but in all there is a very evident irregularity of the striæ near the suture.

Mr. Jacoby has suggested ("Biologia" vi, i. p. 263) that the genus is not sharply defined as to the species included by Clark, although a species is added (*nitida*) which rather adds to the confusion. While it must be admitted that the species above described differs somewhat generically from the species which Mr. Jacoby thinks should alone remain (those with anterior angles prominent externally) I feel unwilling to suggest a new name until the already known species are more carefully placed.

Occurs in Michigan and Louisiana (Schwarz), in Georgia (Morrison), Kansas (cabinet LeConte).

TRICHALTICA Harold.

Head inserted as far as the eyes, these oval, entire and coarsely granulated. Front obtusely carinate, the tubercles distinct, separated by a line and limited above by a moderately deep transverse groove. Antennæ slender, very slightly thicker externally, joints 1–4–5–11 longer than the others, which are equal. Labrum transverse, arcuate in front. Maxillary palpi rather short, the last joint elongate, conical, longer than the preceding, which is as broad at apex as long. Thorax broader than long, the base regularly arcuate, a deep antebasal groove which turns backward toward the base at its ends. Elytra a little wider at base than the thorax, the sculpture consisting of coarse punctures arranged in ten very regular striæ and on short scutellar stria. Prosternum separating the coxæ, the cavities rather widely open behind. Mesosternum oblique. Ventral segments 1–4 gradually shorter, the fifth longer than fourth. Legs moderate. Posterior tibiæ not sulcate, with a single, small terminal spur. Claws appendiculate.

This genus was erected by Baron Harold for some Columbian species, to which he added our *Crepidodera scabricula* Cr. In his description he compares it with Diphaulaca and Plectrotetra, the latter rather unnecessarily. The only representative of the former genus known to me is *nitida*, which, unfortunately, seems to be one of the irregular members. From what can be gathered from descriptions the differences between Trichaltica and Diphaulaca consist in the presence of erect hairs on the elytra of the former (very indistinct in our species) and the oval, convex elytra of the latter. In our fauna the only allied genus, in tribal relationship, is Lactica where the elytra are scarcely at all punctate and confusedly.

T. scabricula Crotch.—Oblong, nearly parallel, moderately convex, reddish yellow, elytra blue. Antennæ a little longer than half the body, piceous or brown. Head impunctate. Thorax more than one-half wider than long, not narrowed in front, sides regularly arcuate, hind angles distinct, base arcuate, disc convex, shining, a few scattered, coarse punctures. Elytra wider at base than the thorax, humeri obtuse, umbone scarcely distinct, disc slightly flattened at middle and with ten striæ of coarse, deep and closely placed punctures, a short scutellar row, intervals narrower than the striæ and with distantly placed, short, semi-erect hairs. Body beneath and legs reddish yellow; abdomen sparsely punctate. Length .10—.14 inch.; 2.5—3.5 mm.

In the male the last ventral segment is slightly sinuate each side, the middle lobe slightly bent upward. The first joint of anterior tarsus is also broader than in the female.

This insect is similar in color and style of sculpture to *Crepidodera rufipes*, but is more elongate and less convex, and the elytral punctures much deeper. The two differ radically, in the fact that the anterior coxal cavities are here open, and in Crepidodera closed.

Occurs from Ohio to Texas

Group X.—CREPIDODERÆ.

Antennæ 11-jointed, filiform. Prothorax with a well marked ante-basal transverse impression, usually limited at each end. Anterior coxal cavities closed behind. Ventral segments all free. Posterior tibiæ usually feebly sulcate near the apex. Tarsi of moderate length, the claw joint simple. Claws appendiculate.

This group consists of a portion only of the genera placed there by Chapuis. For the same reasons which have induced me to separate those genera without distinct ante-basal groove from the Halticæ, similar genera have been removed to constitute the group Systenæ. There is, however, an additional reason here. All the Crepidoderæ have the elytra striato-punctate, while in the Systenæ the punctuation is confused.

The following genera occur in our fauna:

All the tibiæ with a terminal spur..... **Hemiglyptus.**
Posterior tibiæ alone with a spur.
Body above glabrous.
Form more or less ovate; ante-basal groove limited each side; antennæ not unusually long..... **Crepidodera.**
Form elongate, parallel; ante-basal groove not limited; antennæ as long as or longer than body..... **Orthaltica.**
Elytra with rows of setæ on the interstices.
Form short, ovate; anterior angles obliquely truncate; antennæ moderate. **Epitrix.**
Form elongate, parallel; anterior angles not obliquely truncate; antennæ long..... **Leptotrix.**

Hemiglyptus occurs in California. Epitrix is represented on both sides of the continent; the other genera belong to the Atlantic region.

From the group as constituted in the Classification of Col. N. A. 1883, p. 352, in addition to Systena the following are removed:

Micraltica has open anterior coxal cavities and the species placed in Haltica.

Ceratoltica has open cavities also, and is placed in Aphthona.

Luperoltica is a composite genus, one species being a Systena, the other a Galerucidæ. It should be entirely dropped from the literature.

HEMIGLYPTUS n. g.

Head inserted on the thorax as far as the eyes, the front obtusely carinate and with two tubercles separated at middle. Eyes oval, rather coarsely granulated. Antennæ a little longer than half the body, gradually thicker externally, joints 2–10 gradually longer, eleventh longer. Clypeus truncate, labrum entire. Mandibles bidentate at apex, the lower tooth shorter. Maxillary palpi moderate in length, the terminal joint fusiform, acute, longer than the preceding joint. Thorax truncate in front, base arcuate, a moderately deep ante-basal transverse impression, limited at each end by a rather deeper longitudinal impression. Prosternum separating the coxæ, dilated behind them, the coxal cavities rather widely closed behind. Mesosternum oblique, metasternum moderate in length. Ventral segments 2–4 equal, fifth a little longer, first as long as the next two. Elytra with indistinct humeri, punctuation confused, rarely with a substriate arrangement. Legs moderate in length, tibiæ gradually broader to apex, outer edge rounded, the anterior and middle tibiæ each with a slender spur; posterior tibiæ obliquely truncate at apex and with a terminal spur. Tarsi two-thirds as long as the tibiæ, claw joint slender, the claws appendiculate.

This genus has been erected for a species of elongate, parallel form, recalling Prasocuris, which must be referred to the Crepidodera series and differing from all the genera known to me in the Halticini by the presence of a spur to each of the tibiæ. The tibiæ themselves are rather stouter, *i, e.*, more dilated at tip than usual in the Crepidoderides, and the oblique truncation of the posterior pair is margined by a row of short, stiff ciliæ.

H. basalis Crotch.—Oblong, parallel, moderately convex, piceous, surface with brown bronze lustre. Antennæ half as long as the body, piceous, five basal joints rufotestaceous. Head smooth, frontal carina broad and flat, having a rhomboid area, tubercles very flat, separated from the front by a finely impressed line, a group of very coarse punctures near each eye. Thorax transversely quadrate, not narrowed in front, sides feebly arcuate, disc convex, the punctures coarse, deep and close, except near the apex, ante-basal impression moderately deep, the longitudinal impressions deeper and extend in front of as well as behind the transverse impression. Elytra distinctly wider at base than the thorax,

the humeri obtusely rounded, umbone distinct, with a slight impression within it, sides parallel, disc convex, the punctuation less coarse than that of the thorax, very irregularly placed, but in some specimens showing the tendency to irregular striæ. Body beneath piceous, slightly bronzed. Abdomen punctate, the first (and last ♀) segment sparsely, the others more closely, surface sparsely pubescent. Legs pale brown to rufotestaceous, the posterior femora usually darker. Length .12—.14 inch.; 3—3.5 mm Plate VII, fig. 2.

In the male the last ventral segment is slightly sinuate each side, the middle lobe broadly, but feebly concave. The first joint of the anterior tarsus is broader than in the female. The antennæ are also longer and more slender. The last ventral segment is also more closely punctate.

In the female there is sometimes a transverse impression of the last segment near the apex.

This species does not show much variation. The elytral sculpture is faintly striate, but usually much confused and irregular. It is very rarely slightly bluish or greenish in color.

As specimens are usually seen in the cabinet the upper surface is glabrous, but in well preserved examples the surface is sparsely clothed with nearly erect short hairs arising from the punctures, usually evident near the sides of the thorax and elytra. There are a few also near the sides of the head.

Occurs in California, especially in the lower portion of the State.

CREPIDODERA Chev.

Front more or less triangular, inserted as far as the eyes, frontal carina more or less distinct, the tubercles often feeble. Eyes round, convex. Antennæ as long as half the body, gradually slightly broader to tip, first joint oblong oval, second half as long, 3–10 subequal, a little longer than second, eleventh longer, acute at tip. Maxillary palpi short, the fourth joint conical, as long as or a little longer than the preceding. Thorax broader than long, an ante-basal impressed line variable in depth, limited at each end by a longitudinal impression. Prosternum distinctly separating the coxæ, dilated behind them and with the epimera closing the coxal cavities. Mesosternum usually distinct, the middle coxæ either moderately or rather widely separated. Metasternum oval or acute in front, and in *robusta* prolonged over the mesosternum. First ventral segment as long as the next three, which are nearly equal in length, fifth a little longer. Legs moderate, the tibiæ rounded on the outer face, the posterior tibiæ obliquely truncate and with a small spur.

The above genus is identical with that defined by Chapuis in the "Genera." In his admirable monograph Foudras has divided the genus into six, to which Weise has added another for the German fauna (Ins. Deutschl. vi, p. 686). From the species before me which represent three of the genera,* while the three native species would form three more, I am heartily in accord with Chapuis and Harold in considering the differences totally insufficient for generic separation.

From those formerly enrolled in Crepidodera in our lists *C. scabricula* has been removed to form a genus Trichaltica in the Lacticites, while *C. basalis* Crotch forms a distinct new genus.

The following have been described by Boheman (Eugenies Resa), and the localities are given so that others may draw their inferences:

C. vafra Boh., loc. cit. p. 194. St. Francisco.

C. suturella Boh., p. 194. California (St. Francisco), Insula Puna.

C. bicolor Boh., p. 195. California (St. Francisco), Taiti.

This is a very small insect, but .05 inch. long.

C. puberula Boh., p. 196. Montevideo, California, Insula Puna, Taiti et Oahu.

This is doubtless an Epitrix.

The localities of the Eugenies Resa material are notoriously badly mixed, and no reliance can be placed upon them. As I have been unable to identify them, notwithstanding all the collecting that has been done in California I think it best to omit them from our lists.

The species known to me may be separated in the following manner:

Form oblong oval.
  Head and thorax yellow, elytra bright blue; prosternum smooth; thorax smooth ..... **rufipes.**
  Head and thorax similar in color to the elytra.
    Elytra uniform in coloration.
      Prothorax with very distinct and rather coarse punctuation.
        Form narrow, elongate; rufotestaceous, with greenish surface lustre; prosternum smooth ..... **longula.**
        Form oval; surface decidedly metallic; thoracic punctuation abundant and intermixed; prosternum sparsely punctate ..... **Helxines.**
      Prothorax extremely finely punctate and very convex; color piceous brown without metallic lustre; prosternum densely and coarsely punctured; ninth stria rather distant from margin ..... **robusta.**

* *C. helxines* is a Chalcoides; *C. modeeri* a Hippuriphila, and *C. rufipes* a Derocrepis.

Elytra at apical third indefinitely testaceous.
Prothorax very distinctly punctate; prosternum densely punctate. **Modeeri.**
Form broadly oval and convex; color rufotestaceous, without metallic lustre; abdomen piceous.
Prothorax not distinctly punctured; prosternum punctate.....**atriventris.**
Form ovate, a slight gibbosity at the middle of base of each elytron.
Prothorax coarsely and moderately closely punctate; color piceous black, shining.....**nitens.**

C. rufipes Linn.—Oblong oval, nearly parallel, moderately convex; head, thorax and legs reddish yellow, elytra blue, shining. Antennæ as long as half the body, gradually thicker externally. Head smooth, frontal carina obtuse, tubercles distinct, well separated, distinctly limited above by a broadly V-shaped line. Thorax nearly twice as wide as long, sides behind nearly parallel, in front arcuately narrowed to the apex, disc convex, almost absolutely smooth, a deep transverse ante-basal impression, limited at each end by a deep longitudinal impression which does not extend anterior to the transverse one. Elytra a little wider at base than the thorax, obtuse, umbone moderately prominent and smooth, a slight impression within it, disc moderately convex, a long scutellar stria of punctures and nine discal striæ of coarse, closely placed punctures, the outer not more distant from the margin than from the eighth, intervals narrower than the striæ, slightly convex, and with a few minute punctures. Prothorax beneath entirely smooth. Metasternum and abdomen piceous, the latter sparsely punctate and with short, sparse pubescence. Length .10 inch.; 2 5 mm.

The male has a slight impression at the middle of the apical margin of the last ventral segment and the first joint of the anterior tarsus dilated.

This common European species has probably been introduced into our fauna, and is now widely scattered over the Atlantic region as far west as Iowa.

C. longula n. sp.—Elongate oval, nearly parallel, moderately convex, pale rufotestaceous, surface with distinct greenish lustre. Antennæ half as long as the body, very slightly thicker externally. Head smooth, frontal carina distinct, tubercles small, but indistinct. Thorax nearly twice as wide as long, very little narrowed in front, sides feebly arcuate, anterior angles slightly oblique, a feeble sinuation behind them, disc convex, ante-basal impression moderately deep, abruptly bent toward the base at each end, surface with moderately coarse and unequal punctures, irregularly scattered over the thorax. Elytra very little wider than the thorax, humeri rounded, umbone not prominent, disc moderately long, scutellar and nine discal striæ of coarse and rather closely placed punctures which are finer near apex, the ninth not distant from margin, intervals narrower than the striæ and with a single row of fine punctures. Prosternum and pleuræ smooth. Abdomen sparsely punctate, not pubescent. Length .10 inch.; 2.5 mm.

The last ventral of the male has a feeble impression at apex and the first joint of anterior and middle tarsi dilated.

While the color is entirely pale, there is a distinct greenish surface lustre. The suture is very narrowly piceous, the color becoming broader, but more indefinite near the base. In form this species is similar to Orthaltica.

Collected near McPherson, Kansas, by Mr. William Knaus on willows.

C. Helxines Linn.—Oval, slightly oblong, moderately convex, piceous, surface metallic, varying from brown bronze to blue or green, antennæ and legs pale. Antennæ half as long as the body, very slightly thicker to tip, pale rufotestaceous, often darker toward tip. Head smooth, frontal carina distinct, tubercles not evident, but replaced by an oblique ridge. Thorax more than half wider than long, not narrowed in front, sides very feebly arcuate, anterior angles obliquely truncate, disc moderately convex, ante-basal impression deep and at each end suddenly flexed to the base, the surface coarsely, but unequally punctate. Elytra distinctly wider at base than the thorax, obliquely rounded, umbone moderately prominent, a slight depression within it, disc with a scutellar and nine discal striæ of moderate punctures, not closely placed, becoming gradually finer to apex, intervals broader than the striæ, very minutely punctate or smooth. Prosternum punctate, but not densely. Abdomen sparsely, finely punctate, with few hairs. Legs rufotestaceous, the posterior femur usually darker. Length .09—.13 inch.; 2.2—3.3 mm.

In the male the last ventral segment has a slight impression at apex.

This species seems to vary in a manner similar to that observed in Europe, and the reddish or brownish bronze forms seem the most abundant. There is a decided variation in the sculpture of the elytra. In the specimens from the more northern regions of our country the elytra are distinctly striate, while those from the warmer regions and California have simply the rows of punctures. Consequently, those with the elytra simply striato-punctate, the intervals are flat, while those punctato-striate have convex intervals. The interstitial punctuation is always fine, but in some specimens before me cannot be observed.

Specimens have been observed from nearly every part of the United States.

C. robusta Lec.—Oval, slightly oblong, convex, facies robust, piceous brown, shining, legs and antennæ brownish testaceous. Head smooth, frontal carina obtuse, tubercles flat, transverse, not separated, limited above by a fine sinuous line. Antennæ half as long as the body, joints 3-10 very slightly increasing in length and width, eleventh a little longer and acute at tip. Thorax very nearly twice as wide as long, slightly narrowed in front, sides rather irregularly arcuate, obliquely rounded near the front angles, disc rather strongly convex, sparsely, very finely punctate, ante-basal transverse impression moderately deep, the lon-

gitudinal impressions deep, slightly oblique and extending one-third the length of the thorax. Elytra not wider at base than the thorax, humeri obliquely rounded, umbone moderate and smooth, disc convex, with nine striæ of moderately coarse punctures, rather closely placed near the base, more distant and finer at apex, the ninth distant from the margin, a scutellar stria extending one-third from base, intervals flat, very minutely, sparsely punctulate. Prosternum coarsely and closely punctate, the pleuræ smooth. Abdomen rather closely punctate, scabrous, first segment smoother. Length .12 inch.; 3 mm.

In this species the metasternum is prolonged in front in an acutely oval process, almost meeting the prosternum, and the mesosternum is consequently practically invisible. In all the species of Crepidodera (sensu Chapuis) the metasternum varies in form in such a manner as to render it impracticable to use it for the separation of genera. By the Chapuis table *robusta* would, in all probability, be supposed to be a Mniophilite, but these have the anterior coxal cavities open and the thorax without transverse impression.

With the general form of *Modeeri* the present species has the thorax more convex than usual, so that the head is scarcely visible from above. The ninth discal stria is rather distant from the marginal, a character unknown in our other species. It is probable that *robusta* should be separated generically, and with other species having similar characters such a course would be advisable.

By a clerical error Dr. LeConte describes the thorax as twice as long as wide.

This species is rare at present; the only two known to me, except the type, are in the collections of Mr. Blanchard and Mr. Ulke, who have kindly given me the use of all their material.

Collected in the White Mountains, N. H.

C. Modeeri Linn.—Oval, narrowed in front, moderately robust, piceous, with slight æneous lustre, apical third of elytra indeterminately testaceous. Antennæ half as long as the body, gradually broader externally, brownish or piceous, the four basal joints pale. Head alutaceous, sparsely punctate, frontal carina distinct, but obtuse, the tubercles not well defined. Thorax one-half wider than long, sides nearly parallel behind, arcuately narrowed in front, disc convex, a moderate ante-basal transverse impression, limited at each end by a deep longitudinal impression which extends slightly in front of the transverse one, disc convex, surface alutaceous, the punctures coarse, moderately close, but not deep, behind the impression smoother. Elytra distinctly wider at base than the thorax, humeri obtusely rounded, umbone moderate, slightly impressed within, disc moderately convex, scutellar stria long, disc with nine striæ of coarse punctures, moderately closely placed near the base, becoming finer and more distant near the apex, the ninth stria not distant from the margin. Prosternum coarsely and closely punctured, the pleuræ smooth. Abdomen finely, indistinctly punctate, with fine pubescence. Legs brown, the anterior and middle pair usually paler. Length .08—.10 inch.; 2—2.5 mm.

The male has a slight impression at the apex of the last ventral and the first joint of anterior and middle tarsi dilated.

The specimens taken in our fauna are of the color described above, but varieties occur in Europe bluish or green. It is usually found on aquatic plants in the manner of Donacia.

Occurs in Canada, at Detroit, also in Oregon.

C. atriventris Mels.—Form rather broadly oval and convex, rufotestaceous, without metallic lustre. Antennæ half as long as the body, pale rufotestaceous, very slightly thicker externally. Thorax twice as wide as long, sides posteriorly feebly arcuate, anteriorly obliquely truncate, a slight angulation one-third from apex, disc convex, impunctate, ante-basal transverse impression moderately deep, rectangularly bent at each end to the base. Elytra wider at base than the thorax, humeri rounded, umbone scarcely prominent, disc convex, scutellar stria long, nine discal striæ all with coarse, moderately closely placed punctures, which become rapidly finer to apex, ninth not distant from the margin, intervals a little broader than the striæ, slightly convex and smooth. Prosternum indistinctly coarse punctate, pleuræ smooth. Metasternum and abdomen piceous, the latter sparsely, indistinctly punctate. Legs pale rufotestaceous. Length .06—.07 inch.; 1.5—1.75 mm.

The specimens before me are all females. The male characters are probably as in *Modeeri*.

This is the smallest species in our fauna. It is known by its rather broadly oval and convex form and the very oblique truncation near the front angles.

Occurs from Massachusetts to Maryland.

C. nitens n. sp.—Ovate, robust, black, shining. Antennæ pale rufotestaceous; front smooth. Thorax rather more than twice as wide as long, distinctly narrowed in front, sides slightly arcuate, obliquely truncate at the front angles, disc convex, the punctures rather coarse and deep, but not crowded, intervals smooth, ante-basal impression feeble, but slightly arcuate toward the base. Elytra scarcely wider at base than the thorax, humeri rounded, umbone rather feeble, disc convex, with a vague transverse depression one-third from base and along the suture, giving the aspect of a feeble gibbosity on each elytron, striæ not impressed, the punctures relatively small, not closely placed, intervals flat, much wider than the striæ, smooth and shining. Prosternum and pleuræ coarsely punctate. Abdomen sparsely punctate. Femora piceous black, tibiæ brown, tarsi paler. Length .08 inch.; 2 mm.

This species has been found rather troublesome to place generically. The form and facies suggest Epitrix, but there is no pubescence, nor are there any fine punctures in the intervals to suggest their probable presence; the metasternum in front is rather broad, as in *Modeeri*, and suggests a relationship with that species, although quite different in form and appearance. With a predilection for

placing it in Epitrix, a strict interpretation of characters, as at present used, makes it necessary to place it for the time in Crepidodera.

Three specimens, Illinois.

EPITRIX Foudras.

The differences between this genus and Crepidodera are very feeble, and in fact there is but one constant. While in that genus the upper surface is entirely glabrous, in this the upper surface has short, semi-erect hairs, sparsely placed over the thorax and at the sides, and on the elytra arranged in a single row on each interval. The frontal carina is feeble and the tubercles are absent; there is, however, an oblique ridge each side extending from the end of the frontal carina to the eye, limited above by a well impressed line, the two forming together a broad V. The anterior angles of the thorax are conspicuously obliquely truncate, the truncation posteriorly limited by a dentiform process. The ante-basal impressions are variable according to the species, well marked in some or feeble, and almost obliterated in others. The elytra are punctato-striate with punctures of variable size according to species, the intervals rarely wider than the striæ and with a single row of finer punctures from which the seriate hairs arise.

The sexual characters are rather feeble; the male has the first joint of the anterior tarsus broader than in the female, the last ventral segment shorter and subtruncate, while the surface of the abdomen is less distinctly punctate than in the female.

The species are not numerous; those of Europe live on plants of the order Solanaceæ. Harris states that *cucumeris* injures cucumber vines. It is probable that the natural food plants of our species are of the same order as those of Europe.

The following table will assist in the recognition of the species:

Species of piceous surface.
  Thorax very densely and coarsely punctate; ante-basal impression feeble ..... **fuscula.**

Thorax not densely punctate, the punctures well separated.
  Ante basal impression well marked.
    Elytral striæ rather deep, the punctures coarse, close and quadrate; punctures of thorax close, though separated ..... **lobata.**
    Elytral striæ, especially those nearest the suture, very feeble; the punctures round and not crowded ..... **cucumeris.**
  Ante-basal impression very feeble.
    Species quite small; thoracic punctures close, but not crowded... **brevis.**

Species with distinct æneous surface lustre.

Thorax closely punctate; impression distinct. ..... **subcrinita.**

Species rufotestaceous; legs always pale.

Thorax moderately closely punctate, the ante-basal impressions scarcely visible ..... **parvula.**

E. fuscula Crotch.—Form ovate, rather robust, piceous, feebly shining. Antennæ rufotestaceous, sometimes darker toward the apex. Front with a few coarse and deep punctures. Thorax twice as wide as long, slightly narrowed in front, sides moderately arcuate, anterior angles obliquely truncate, disc convex, punctuation coarse, dense and deep, the ante-basal impressions feeble, being almost obliterated by the punctuation. Elytra scarcely wider at base than the thorax, humeri obtuse, umbone moderately prominent, disc regularly convex, the striæ of the middle slightly impressed and acute, round, not crowded punctures, those at the sides deeper, with deep and closely placed punctures, intervals near the suture distinctly wider than the striæ and all with a single series of minute punctures. Prosternum coarsely, not closely punctured. Abdomen piceous, sparsely punctate and pubescent. Femora of all the legs piceous, tibiæ and tarsi rufotestaceous. Length .08 inch.; 2 mm.

This species is, as a rule, larger and more robust than *cucumeris*, the thoracic punctuation so close, coarse and deep that it would be called cribrate if in the same proportion on a larger insect and the ante-basal impressions very feeble.

Seems to be a widely distributed species over the entire country east of the Mississippi, also in Missouri.

E. lobata Crotch.—Ovate, of robust facies, piceous, feebly shining. Antennæ rufotestaceous. Front smooth, a few coarse punctures near the eye. Thorax twice as wide as long, slightly narrowed in front, sides nearly straight, obliquely truncate at anterior angles, disc convex, the punctures coarse and deep, round, not densely crowded, the intervals shining, the ante-basal impression moderately deep, arcuate at middle toward the base, the longitudinal impressions distinct. Elytra distinctly wider at base than the thorax, humeri rounded, umbone distinct, disc rather deeply striate, the punctures coarse, deep, quadrate and closely placed, the intervals very narrow and at the sides almost like acûte costæ, each with a row of fine punctures. Prosternum coarsely, not closely punctate. Abdomen brownish, sparsely punctate and pubescent. Legs rufotestaceous, the posterior femora piceous. Length .06—.08 inch.; 1.5—2 mm.

The species with *fuscula* and *cucumeris* are closely related. *E. lobata* has a more closely punctate thorax than *cucumeris*, but much less so than in *fuscula*. The latter has the ante-basal impression almost entirely obliterated. In *lobata* the elytral punctures are denser, coarser and deeper than in either of the others.

Occurs in North Carolina and Florida, N. Smyrna (Schwarz).

E. cucumeris Harris.—Ovate, slightly oblong, piceous, shining. Antennæ rufotestaceous. Head smooth, rarely with a few punctures near the eye. Thorax nearly twice as wide as long, slightly narrowed in front, anterior angles obliquely

truncate, sides moderately arcuate, disc convex, the ante-basal impression deep and slightly arcuate toward the base, the longitudinal impressions well marked, the punctures moderately coarse, not closely placed, the intervals well marked and shining. Elytra slightly wider at base than the thorax, humeri distinct, umbone moderately prominent, disc regularly convex, striæ very feebly impressed punctures large and closely placed, but distinctly separated, intervals narrow shining, with a single series of fine punctures. Prosternum coarsely and rather closely punctate, the pleuræ smooth. Abdomen piceous, shining, sparsely punctate and pubescent. Legs rufotestaceous, posterior femora piceous. Length .06—.08 inch.; 1.5—2 mm.

This species varies somewhat in the punctuation of the thorax, at times being rather sparser and again comparatively close, but never so dense as in *fuscula* or *lobata*. The anterior and middle femora are at times brownish.

Widely distributed from Massachusetts to Georgia and westward to California.

E. brevis Schwarz.—Form broadly ovate, piceous, shining. Antennæ rufotestaceous. Head brownish, front smooth, a small group of punctures near each eye. Thorax fully twice as wide as long, slightly narrowed in front, sides distinctly arcuate, anterior angles obliquely truncate, disc convex, the punctuation moderate in size, not closely placed, distant from each other by their own diameters, ante-basal impression very feeble, the longitudinal impressions not evident. Elytra a little wider at base than the thorax, humeri distinct, umbone moderately prominent, striæ scarcely at all impressed on the disc, but deeper at the sides, the punctures of the former rounded and distinct, those at the sides more quadrate and closer, intervals very narrow, with a single series of fine punctures. Prosternum coarsely and rather closely punctate, pleuræ smooth. Abdomen piceous, shining, sparsely punctate and slightly pubescent. Legs pale rufotestaceous, posterior femora piceous. Length .06 inch.; 15 mm.

By its comparatively sparsely punctate thorax this species is related to *cucumeris*, but differs in its shorter form and the feeble ante-basal impressions.

Collected by Mr. E. A. Schwarz at Enterprise, Florida, and at Columbus, Texas.

E. subcrinita Lec.—Oblong ovate, moderately convex, surface with distinct æneous lustre. Antennæ rufotestaceous, slightly darker externally. Head smooth at middle, a group of coarse punctures near each eye. Thorax nearly twice as wide as long, not narrowed in front, except by the obliquely truncate front angles, sides very slightly arcuate, disc convex, punctuation moderately coarse and very close, but not densely crowded, the ante-basal transverse impression well defined and straight, the longitudinal impressions well marked. Elytra distinctly wider at base than the thorax, humeri distinct, umbone moderately prominent and smooth, disc evenly convex, striæ very feebly impressed, the punctures large, closely placed, intervals narrow, with a series of finer punctures. Prosternum coarsely sparsely punctate, the pleuræ smooth. Abdomen piceous, shining, sparsely punctate and very slightly pubescent. Legs rufotestaceous, the posterior femora piceous. Length .08 inch.; 2 mm.

This species is easily known by the submetallic surface lustre, and is of more oblong form than any other, except *parvula*. It represents in our fauna the *intermedia* Foudras of southern Europe.

Occurs in Oregon, California, Nevada and Arizona.

E. parvula Fab.—Oblong ovate, moderately convex, rufotestaceous, abdomen brown, elytra often with a dark, transverse cloud at middle. Antennæ pale rufotestaceous, the outer four joints usually darker Head smooth, with several large punctures near each eye. Thorax nearly twice as wide as long, not narrowed in front, sides arcuate, feebly obliquely truncate at the front angles, disc convex, the punctures moderate, rather closely placed, but not dense, the intervals shining, ante-basal groove almost entirely obliterated. Elytra very little wider than the thorax, humeri rounded, umbone feeble, striæ feebly impressed on the disc, a little deeper at the sides, the punctures moderate and not crowded on the disc, closer and deeper at the sides, the inner intervals a little wider than the striæ and flat those at the sides narrow and slightly convex, all with a row of finer punctures. Prosternum coarsely, but not closely punctate. Metasternum and abdomen brown, the latter sparsely punctate and feebly pubescent. Legs pale rufotestaceous. Length .06—.08 inch.; 1.5—2 mm.

Very many of the specimens are entirely rufotestaceous above, but others have an indistinct transverse cloud at the middle of the elytra. In one specimen before me this forms a well marked band, which does not reach the suture, the latter narrowly bordered with brown. The legs are uniformly rufotestaceous.

Occurs throughout the entire United States, extending also to the West India islands.

ORTHALTICA Crotch.

Head oval, moderately deeply inserted, the eyes free, these round, moderately prominent. Frontal carina short, obtuse, the tubercles prominent and well separated. Labrum short, truncate. Maxillary palpi slender, but short; the terminal joint elongate conical, as long as the preceding. Antennæ three-fourths the length of body ♂, shorter in ♀, first joint stout, claviform, second half as long, the others dissimilar in the sexes, terminal joint acute at tip. Thorax broader than long, scarcely wider at base, apex truncate, base arcuate, sides arcuate, the margin not thickened in front, disc convex, a moderately deep ante-basal impressed line not limited externally by a longitudinal impression, the ends gradually approaching the base. Prosternum moderately separating the coxæ, dilated behind them, and with the epimera closing the coxal cavities behind. Mesosternum not wide, nearly horizontal. First ventral segment as long as the next three, these gradually decreasing in length, fifth longer than

the fourth. Legs rather short, tibiæ slightly broader to tip, outer edge rounded, posterior terminated by a short spur, tarsi stout, claws appendiculate at base. Elytra striato-punctate; surface glabrous.

The antennæ are dissimilar in the sexes. In the male they are more than three-fourths and in the female shorter and more slender.

This genus was instituted by Crotch for two species, one of which cannot remain, in such a brief and unsatisfactory manner that it would not be possible to refer it with certainty to any group, except by inference from the position in which it was placed in the paper.

It is closely related to Crepidodera, and differs especially in the form of the ante-basal groove and the very long antennæ dissimilar in the sexes. The form is similar to Pseudepitrix, but more convex.

Two species are known to me which may be separated in the following manner:

Antennæ rather stout in both sexes; punctures of striæ confused on each side of scutellum; ante-basal impression moderately deep, but not sharply impressed; color usually piceous or brownish; front punctate.....**copalina.**

Antennæ slender (in both sexes?); striæ entire, not confused near the scutellum; ante-basal impression deep and sharply defined; color pale rufotestaceous; front smooth .....**melina.**

O. copalina Fab.—Elongate parallel, moderately convex, shining, brownish or piceous, in the latter case the head and thorax paler. Antennæ rufotestaceous. Head shining, coarsely punctate, front rather flat. Thorax one-half wider than long, base scarcely broader than apex, sides arcuate, more distinctly in front, margin finely serrate, disc convex, the punctuation coarse and deep, but not dense, ante-basal sulcus moderately deep, feebly arcuate, joining the basal margin near the hind angles. Elytra distinctly broader than the thorax, humeri rather prominent, umbone distinct, limited within by a slight depression, disc convex, with nine striæ of coarse, closely placed punctures, the outer distant from the margin, those of the inner series confused near the scutellum, intervals narrower than the striæ and slightly convex. Body beneath colored as above. Abdomen with very few punctures. Legs rufotestaceous. Length .08—.10 inch.; 2—2.5 mm.

In the male the antennæ are rather more than three-fourths the length of the body, first joint stout, clavate, second conical, more slender, half as long, third and fourth equal, a little longer than second, fifth distinctly longer than either fourth or sixth, joints 6–10 very gradually shorter and slightly stouter, eleventh one half longer than the tenth, acuminate at tip.

In the female the antennæ are about half the length of body, rather more distinctly thickened toward tip; joints 1–2 as in male, third as long as second, but more slender, joints 4–10 shorter than third, equal in length, eleventh longer and acuminate.

In addition to the sexual characters already noted in the antennæ, the males have the first joint of the anterior tarsi more dilated and the last ventral has a small, but deep triangular impression near the apex.

Occurs from Massachusetts to Florida, westward to Missouri and Iowa.

O. melina n. sp.—Elongate, parallel, pale rufotestaceous, shining. Front convex, smooth, the carina obtuse, tubercles distinct. Thorax about one-half wider than long, widest in front of middle, sides arcuate, slightly oblique in front of base, margin entire, not crenate; disc convex, punctures rather coarse, sparsely irregularly placed, the ante-basal impression well defined and deep, extending from side to side. Elytra wider at base than the thorax, humeri rounded, umbone moderate, disc convex, with feebly impressed striæ of moderate punctures not closely placed, intervals flat, smooth. Prosternum and pleuræ smooth. Metasternum and abdomen brown or piceous, the latter sparsely punctate. Legs pale. Length .06—.08 inch.; 1.5—2 mm.

Unfortunately, the males before me are deprived of antennæ. Those of the female are more slender than in *copalina* and gradually stouter to tip. The males have the first joint of the anterior tarsi dilated and an impression at the apex of the last ventral segment. In some specimens the body beneath is entirely pale like the upper surface.

Occurs in Kansas and Texas.

LEPTOTRIX n. g.

Head triangularly oval, not deeply inserted in the thorax. Eyes free, slightly longer than wide, coarsely granulated. Antennæ slender, slightly thicker externally, third joint shorter than second. Front vertical, the carina short and obtuse, tubercles small and indistinct. Clypeus truncate, labrum small, arcuate in front. Maxillary palpi moderate in length, the terminal joint short, conical. Thorax truncate at apex and base, the angles distinct, the anterior slightly prominent externally, lateral margin distinctly crenate, disc with an ante-basal and moderately deep impression, which at each end bends abruptly toward the base. Elytra wider at base than the thorax, humeri distinct, disc striato-punctate, the intervals with short semi-erect hairs as in Epitrix. Prosternum rather wide between the coxæ, apex truncate, the coxal cavities closed. Legs moderate in length, the posterior thighs rather feebly dilated, tibiæ slender, not grooved externally, the posterior with a minute spur. Tarsi moderate in length, claws appendiculate at base.

The antennæ are slender, thickened externally, especially the last five joints, without, however, forming a distinct club. The first joint is stout, not as long as the next two, second as stout, but shorter; third more slender, a little shorter than second, four to six equal to third, seven to ten a little broader, although slightly decreasing in length, eleventh a little longer than the seventh.

This genus is rather unwillingly made for a small Californian species which cannot be placed in any genus of Crepidoderides, although related to Orthaltica and Pseudepitrix. While it resembles the first in its narrow and parallel form it differs in the shorter antennæ and presence of setæ on the elytral intervals. Pseudepitrix has still more slender antennæ, the third joint longer than second, the base of thorax on each side oblique and a very narrow prosternum.

As Epitrix is closely related to Crepidodera, but with interstitial setæ, so is the present genus to Orthaltica and Pseudepitrix to Sangaria.

L. recticollis Lec.—Elongate, parallel, moderately convex, pale reddish brown, shining, surface sparsely hairy. Antennæ a little longer than half the body, pale, the outer joints slightly darker. Head alutaceous, sparsely indistinctly punctate. Thorax distinctly broader than long, narrower at base than apex, sides arcuate, the margin distinctly crenate, anterior angles prominent externally, disc convex, coarsely and deeply, but not closely punctate. Elytra wider at base than the thorax, humeri obtusely prominent, umbone scarcely evident, disc slightly flattened at middle, striato punctate, the punctures rather coarse, close and quadrate, as wide as the intervals on the disc, the intervals wider at the sides, scutellar stria one fourth the length of suture; intervals flat, with a single series of fine punctures, each with a short semi-erect hair. Prosternum smooth. Abdomen brown or piceous, with very few punctures and short hairs. Legs rufotestaceous. Length .07—.09 inch.; 1.75—2.25 mm. Plate VI, fig. 11.

In the small number of specimens examined no sexual differences have been observed.

Occasionally the elytra are slightly clouded along the suture with fuscous, and then there is a faintly evident æneous lustre, otherwise there seems to be no variation.

Occurs in California and Oregon, and seems rather rare in collections.

Group XI.—ARSIPODES.

Antennæ 11-jointed. Pronotum without *transverse* impression at base. Anterior coxal cavities closed behind, ventral segments free. Fourth joint of hind tarsus simple. Posterior tibiæ with a small simple spur.

By these few characters it will be seen that the group forms the link between the Crepidoderæ on the one hand with the Chætocnemæ.

But one genus is known in our fauna characterized by the well marked, short, longitudinal basal impression. In much of the European literature the name Balanomorpha is used, but Mantura should properly remain.

MANTURA Steph.

Head inserted as far as the eyes, front flat, without carina or tubercles. Eyes rounded, entire, rather coarsely granulated. Labrum narrow, slightly sinuate at middle. Antennæ slender, half as long as the body, the outer five joints abruptly slightly broader. Maxillary palpi cylindrical, last joint elongate conical, a little shorter than the preceding. Thorax much broader than long, narrower in front, a deep impression adjacent to the base, opposite the middle of each elytron extending nearly half way to apex, no transverse impression. Prosternum moderately separating the coxæ, the cavities closed behind. Middle coxæ more widely separated, the mesosternum declivous. First ventral segment nearly as long as all the others. Legs rather short, tibiæ gradually slightly broader to tip, each one with a small terminal spur, outer edge rounded, slightly flattened near the apex; claws simple.

This genus is the only representative in our fauna of the group Arsipodites of Chapuis (Genera xi, p. 37), which is closely related to the Crepidoderites differing only in the absence of the transverse ante-basal impression. The longitudinal impressions are deeper than in any of our Crepidoderites and are triangular in form, broadest at the base of the thorax. Mantura is notable in being one of the few genera of Halticides with a spur on each tibia.

M. floridana Crotch.—Elongate oval, moderately convex, brownish, surface with faint bronze lustre, elytra indefinitely paler at apical third. Head alutaceous, coarsely, not closely punctate, a well marked, transverse groove between the eyes. Thorax nearly twice as wide as long, widest at base, gradually narrowed in front, sides feebly arcuate, apex truncate, base arcuate, a little more broadly at middle, disc convex, coarsely, deeply and moderately closely punctate,

basal impressions deep, triangular, reaching nearly to middle. Elytra scarcely wider at base than the thorax, humeri obliquely rounded, umbone not prominent, disc with ten entire striæ of moderately coarse punctures, closely placed, but not serrate, the outer stria distant from the margin, a short scutellar stria of but few punctures, intervals broader than the striæ, smooth. Body beneath brown, the abdomen almost smooth. Legs rufotestaceous, the hind femora darker. Length .08 inch.; 2 mm.

The only sexual difference apparent in the specimens before me is in the broader first joint of the anterior tarsus of the male.

Specimens occur with the apical pale space quite sharply limited, while others have been seen in which the elytra are almost entirely piceous.

Occurs from Massachusetts (Blanchard) to Florida and Texas. I have seen one in the LeConte cabinet from California.

Group XII.—EUPLECTROSCELES.

Antennæ 11-jointed. Anterior coxal cavities closed behind. Thorax with a faint ante-basal impressed line. Middle and posterior tibiæ sinuate near the apex, the posterior grooved their entire length. Tarsal claws divaricate, not appendiculate. Ventral segments all free.

This group is suggested for the genus Euplectroscelis *Crotch*, which that author had associated with Chætocnema. From the group containing the latter it differs in the free ventral segments, the presence of a feeble ante-basal impression, the irregularly punctate elytra and the simple claws. The only other tribe to which the key of Chapuis directs is the Oxygonites, from which the form of the tibiæ and claws at once separates it.

As remarked by Crotch the facies of the only species known is rather that of a Eumolpide than a Halticide.

EUPLECTROSCELIS Crotch.

Head inserted in the thorax as far as the eyes, front not carinate, the tubercles distinct and widely separated, clypeus arcuate in front. Labrum transverse, slightly emarginate at apex. Maxillary palpi slender, second joint elongate conical, third cylindrical, fourth acutely oval, longer than the preceding and not narrower at base than it. Antennæ slender, a little longer than half the body, first joint elongate conical, second short, oval, third twice as long, joints 4–7 equal, a little longer than third, 8–10 slightly progressively shorter, elev-

enth longer, acute at tip. Thorax transverse, a very vague, arcuate, ante-basal impressed line. Scutellum triangular. Elytra a little wider at base than the thorax, punctuation coarse and confused. Prosternum rather narrow between the coxæ, dilated behind them joining the epimera, the coxal cavities closed behind. First ventral segment not much longer than the second, the articulation between them well marked, not connate. Legs moderately long. Tibiæ slightly broader at apex, the outer edge with a feeble groove extendtending their entire length, limited on each side by a fine carina; middle and posterior tibiæ sinuate near the apex, the sinuation limited above by a tooth, below which the margin is ciliate. Posterior tibia alone slightly arcuate and terminated by a spur. Tarsi moderately long, the first joint nearly as long as the others together, the last joint slender, the claws stout, divaricate and not appendiculate at base.

This genus was described by Crotch, and placed by him in association with Chætocnema, a position in which it cannot be allowed to remain for reasons already given.

One species is known:

E. Xanti Crotch.—Oblong oval, robust, pale ochreous, upper surface darker and with a slight purplish lustre. Antennæ longer than half the body, brownish, darker outwardly. Head with irregular surface, coarsely cribrately punctured between and above the eyes. Thorax twice as wide as long, scarcely narrower in front, sides arcuate, anterior angles acute outwardly, hind angles obtuse, sides feebly arcuate, disc moderately convex, a feeble, but distinct ante-basal impression, another post-apical, parallel with the margin, surface with very coarse, closely placed punctures which are cribrate near the sides, basal marginal line distinct, the edge slightly reflexed. Scutellum smooth. Elytra a little wider than the thorax, humeri rounded, umbone moderately prominent and smooth, disc coarsely and closely punctate, punctures confused, but with a vague tendency to a strial arrangement, in some specimens the intervals, by their regularity, vaguely resemble costæ. Abdomen sparsely punctate and shining at middle, more densely and finely punctate at the sides and finely pubescent. Femora pale rufotestaceous, the tips brownish, tibiæ and tarsi brown. Length .24—.26 inch.; 6—6.5 mm. Plate VII, fig. 3.

In the male the first joint of the four front tarsi is rather broadly dilated, the last ventral broadly emarginate at the middle of the apex. In the female the last ventral is longer and oval at tip.

This insect has rather the facies of a Colaspis than a Halticide.

Occurs in the peninsula of Lower California.

Group XIII.—CHÆTOCNEMÆ.

Antennæ 11-jointed. Thorax without trace of ante-basal impression. Elytra regularly striato-punctate. Anterior coxal cavities closed behind. Middle and posterior tibiæ distinctly sinuate on the outer edge near the apex, the sinuation limited above by an angulation. Tarsal claws appendiculate at base. Abdomen with first two segments closely united and immobile, the suture distinct.

This tribe is sufficiently well characterized among those with closed coxal cavities by the close union of the first two ventral segments. By this character alone it may be distinguished. In our fauna but one genus is known, the species having a facies that will enable it to be recognized without difficulty.

CHÆTOCNEMA Steph.

Head inserted in the thorax as far as the eyes, the front flat, not carinate (in our species). Clypeus broadly emarginate, labrum truncate. Maxillary palpi rather slender, the second and third joints obconical, the last joint more slender, elongate conical. Antennæ slender, at least half the length of the body, slightly thicker externally, first joint clavate, second elongate oval, third to sixth slender and longer, seven to eleven gradually broader and flattened, the terminal joint nearly as long as the two preceding, acute at tip. Thorax always broader than long, usually twice as wide, narrowed in front with but few exceptions, sides regularly arcuate, obliquely truncate at the front angles in some, base regularly arcuate. Scutellum transverse. Elytra at most but little wider than the thorax at base, humeri never prominent, surface striato-punctate. Prosternum moderately wide between the coxæ, usually coarsely punctate, the apex dilated behind and with the epimera closing the coxal cavities. Abdomen with the first two segments connate, the suture, however, distinct. Legs moderately long, the middle and posterior tibiæ broader below the middle and with a sinuation limited above by a more or less triangular tooth, the posterior tibiæ more or less grooved at apex on the outer edge, the margins of the groove ciliate with short hair, and above these more or less denticulate, terminated at apex by a moderately stout and long spur. Tarsi moderate in length, the claw joint simple. Claws appendiculate at base. Pl. VII, fig. 9.

Our species belong to the subdivision Chætocnema proper as defined by Foudras and Chapuis, having the flat front, while in Plectroscelis the carina is distinct.

It will be observed in all our species that the genæ are coarsely and closely punctate without any exception; for this reason no mention will be made in the separate descriptions.

In the greatest number of species the thorax has regularly arcuate sides, converging to the apex, but in a small number the anterior angles are obliquely truncate with a post-apical angulation, and in two of these species the thorax is not narrowed in front. In the former series the antennæ, with very few exceptions, have the outer joints piceous, while in those with the angles truncate the antennæ are entirely pale, or in no case decidedly piceous externally.

On comparison of our species with those of Europe it will be seen that the number of species in which the elytral striæ have confused punctuation is more than twice as great as those with regular striæ, while in our fauna only three of the twenty-three have irregular striæ. In number, as many species are known in our fauna as in Europe, including Plectroscelis and Chætocnema under the one name. It is therefore hardly probable that our species will be greatly increased by future collections.

In the accompanying table it has been found necessary to modify the arrangement given by Dr. LeConte (Proc. Am. Philos. Soc. 1878, p. 419) and to remove species from the series with smooth head to the punctate series. By some accident or oversight two of Melsheimer's species had been omitted, but have been studied from the types now in the Museum of Comparative Zoology at Cambridge. My thanks are due to Dr. Hagen for his kind assistance in their discovery.

The following table will assist in the identification of the species, but care must be used in the determination of single examples:

Sides of thorax regularly arcuate from base to apex, without oblique truncation at the front angles.....2.

Sides of thorax obliquely truncate at the front angles, with a post-apical angulation.....13.

2.—Head punctate, sometimes indistinctly.....3.

Head absolutely impunctate.....10.

3.—Punctures of elytral striæ confused or irregular, at base.....4.

Punctures of elytra in regular striæ.....5.

4.—Striæ 1–4 or beyond much confused as far as the middle or even beyond.

The outer two striæ only regular, the confused punctures of disc extending beyond the middle.....1. **cribrata.**

The outer three or four striæ regular, the confused punctures of disc extending barely to middle; sides of elytra opaque.....2. **perturbata.**

Striæ 1–2 or 1–3 irregular, near the base only; punctures of thorax coarse.

Form regularly oval.....3. **irregularis.**

Form elongate, subcylindrical.....4. **subcylindrica.**

5.—Form elongate oval, more than twice as long as wide; punctuation of head well marked.

Piceous, surface æneous; antennæ externally and all the femora piceous. 5. **protensa.**

Pale reddish brown, with slight æneous lustre; antennæ and legs pale rufotestaceous .....6. **brunnescens.**

Form oval, not twice as long as wide.....6.

6.—Punctures of head distinct.....7.

Punctures of head small, indistinct.....8.

7.—Punctures of clypeo-frontal region dense and rugulose, subopaque. 7. **denticulata.**

Punctures of clypeo-frontal region coarse, well separated, surface shining. 8. **cribrifrons.**

8.—Punctures of elytral striæ feebly impressed, nearly obsolete at apex. 9. **pinguis.**

Punctures of striæ well impressed and not obliterated at apex.....9.

9.—Thorax with distinct basal marginal line, without basal series of punctures; surface scarcely alutaceous.....10. **æmula.**

Thorax with distinct basal marginal row of punctures, or with coarser punctures than the discal close to the basal margin.

Head and thorax very opaque, the latter distinctly widest at base; intervals scarcely wider than the striæ.....11. **opacula.**

Head and thorax less opaque, the latter widest at middle; intervals wider than striæ.....12. **minuta.**

10.—Thorax with an entire basal marginal line, which is not defined by punctures.....11.

Thorax with a basal marginal row of punctures, sometimes continued to middle as a line.....12.

11. Legs entirely piceous, surface very distinctly alutaceous and subopaque. 13. **alutacea.**

Legs more or less testaceous or brown, surface shining.

Thorax alutaceous, with median smooth space posteriorly; scutellar stria usually confused; color greenish bronze; tibiæ in part and tarsi piceous.....14. **subviridis.**

Thorax not distinctly alutaceous, without smooth space; scutellar stria regular; color golden bronze; tibiæ and tarsi testaceous. 15. **opulenta.**

12.—Thorax extremely indistinctly punctate.

Thorax indistinctly alutaceous, the basal marginal row of rather coarse distant punctures.....16. **obesula.**

Thorax alutaceous, basal punctures fine and close .....17. **ectypa.**

Thorax finely and sparsely, but very distinctly punctate.

Thorax shining, not alutaceous.....18. **parcepunctata.**

Thorax alutaceous, subopaque.....19. **pulicaria.**

Thorax with coarse, moderately deep punctures, irregularly placed. 20. **crenulata.**

13.—Thorax arcuately narrowed from base to apex.....14.

Thorax transversely quadrate, not narrowed, except at the oblique truncation.....15.

14.—Thorax without distinct basal marginal line..... .....21. **confinis.**
Thorax with nearly entire basal marginal line.
Form oblong, elytral intervals on the disc flat and broader than the striæ.....22. **elongatula.**
Form oval, robust, elytral intervals convex and scarcely wider than the striæ (small species)..... .....23. **dispar.**
15.—Basal marginal line of thorax distinct; antennæ and legs entirely yellow. 21. **quadricollis.**
Basal marginal line indistinct; outer joints of antennæ and all the femora piceous .....25. **decipiens.**

1. **C. cribrata** Lec. Oblong oval, convex, brassy bronzed, shining. Antennæ rufotestaceous, the outer five joints piceous Head alutaceous, the front coarsely and deeply punctate, with a median smooth space, vertex more finely and sparsely punctate. Thorax about one-half wider than long, scarcely narrowed in front, sides arcuate, disc moderately convex, basal marginal line visible only near the hind angles, the surface rather closely punctate, the punctures moderate in size, a little coarser near the sides. Elytra not wider at base than the thorax, humeri very obliquely rounded, sides regularly arcuate, widest at middle, disc punctato-striate, the punctures rather coarse and deep, and moderately closely placed, the punctures of the striæ from the suture a little beyond the umbone very much confused, extending thus beyond the middle, intervals slightly convex, impunctate. Body beneath piceous, faintly bronzed. Prosternum and pleuræ coarsely punctate. Abdomen moderately, closely, but not coarsely punctate. Anterior and middle femora brown, the posterior piceous, bronzed, tibiæ and tarsi rufotestaceous. Length .08 inch.; 2 mm.

This species is best known by the greater extent of the confused punctuation of the elytra, but two of the striæ reaching the humeri at the sides and the irregular punctuation extending quite to the declivity. The surface is shining everywhere, while in *cribratus* the sides of the elytra are decidedly opaque.

The type is from Massachusetts, and I have another specimen from Oregon (no special locality) kindly given me by Mr. H. Ulke.

2. **C. perturbata** n. sp.—Oblong oval, convex, piceous, surface distinctly bronzed and shining, the sides of the elytra more opaque. Antennæ rufotestaceous at base, the outer six joints piceous. Head alutaceous, the punctures moderate in size, not dense. Thorax not much wider than long, sides arcuate, gradually narrowed in front of middle, basal marginal line distinct at the sides, surface shining, not distinctly alutaceous, punctures moderate in size, closely, not densely placed, a little coarser along the base. Elytra not wider at base than the thorax, humeri oblique, umbone feeble, the punctures moderately coarse and deep, much confused at base as far as the fifth or sixth stria and nearly to the middle of the elytra, the striæ at apex and sides regular, the latter deeply impressed and more closely punctate, the intervals convex and without punctures. Body beneath piceous, feebly bronzed, shining. Prosternum closely punctate, the side pieces with few punctures. Abdomen rather coarsely and at the sides closely punctate. Anterior and middle femora brown, posterior piceous bronzed, tibiæ and tarsi rufotestaceous. Length .08 .09 inch.: 2–2.25 mm.

This species has two characters which will enable it to be easily known. The punctures of the striæ at base are truly confused and extend in this condition to the umbone, forming from this a triangle to the middle; the sides of the elytra are opaque, while the disc is shining. In general outline the form is not unlike *denticulata*.

Occurs in Minnesota and at Veta Pass, Colorado (cab. Schwarz).

3. **C. irregularis** Lec.—Oblong oval, convex, not twice as long as wide, piceous, surface distinctly bronzed, feebly shining. Head moderately closely punctate and distinctly alutaceous. Antennæ piceous, three basal joints pale. Thorax very nearly twice as wide at base as long, sides regularly arcuately narrowed to apex, basal marginal line distinct at the sides, surface rather coarsely and closely punctate, a little finer near apex, distinctly alutaceous. Elytra wider than the thorax, humeri rounded, form regularly oval, disc with rows of coarse punctures closely placed, those of the scutellar and first three discal striæ irregular from base one-third to apex, outer striæ impressed and serrately punctate, intervals smooth, wider than the striæ, the outer ones slightly convex, the inflexed border of the elytra with numerous punctures; surface not distinctly alutaceous. Body beneath piceous, slightly bronzed. Prosternum densely and coarsely punctate, the side pieces sparsely punctate. Abdomen sparsely, moderately, coarsely punctate. Femora piceous, tibiæ and tarsi rufotestaceous. Length .08 inch.; 2 mm.

An easily known species and readily separated from all the others with irregular striæ by the characters given in the table.

After an examination of the type of *rudis* Lec. it proves to be a variation with the striæ a little less irregular. It has been unfortunately compared with *cribrata*.

A variety in Mr. Ulke's collection has the striæ much more confused than the typical form, the irregularities extending to the humeri and even beyond the middle. By the table this form might be considered to be *cribrata*, but in this the sides of the elytra are opaque.

Occurs in California from San Jose northward to Oregon, Nevada and Michigan.

4. **C. subcylindrica** Lec.—Oblong, nearly parallel, more than twice as long as broad, piceous, surface with æneous bronze lustre. Antennæ piceous, three basal joints paler. Head alutaceous, punctures not coarse nor closely placed, a smooth median space, front not densely punctured. Thorax about one third wider than long, widest at middle, apex not narrow, sides rather strongly arcuate, disc convex, a slight depression along the base, punctures moderately coarse and close, coarser along the sides and base, surface not distinctly alutaceous. Elytra a little wider at base than the thorax, humeri rounded, umbone scarcely prominent, disc with rows of moderately coarse punctures closely placed, but not serrate, the scutellar and first two discal striæ irregular at base, outer striæ not impressed, intervals not convex, wider than the striæ and smooth, epipleural fold with numerous punctures, biseriate at base. Pros-

ternum coarsely not densely punctate, side pieces with numerous coarse punctures. Body beneath piceous, shining. Abdomen sparsely punctate, more closely on last segment. Legs piceous, the tibiæ and tarsi dark brown. Length .08—.10 inch.; 2—2.5 mm.

This species is readily known by its very elongate subcylindrical form. At first described under the name *cylindrica*, the name was changed, two pages after, in the table, having been already used.

Occurs from Massachusetts to Pennsylvania, Michigan, Wyoming and British Columbia.

5. **C. protensa** Lec.—Very elongate oval, more than twice as long as wide, surface distinctly bronzed, but slightly variable. Antennæ rufotestaceous at base, the outer six joints piceous. Head faintly alutaceous, the punctures not coarse nor close, those of the front closer. Thorax one-third wider at base than long, sides regularly arcuate and narrowing to apex, basal marginal line distinct at the sides, surface not distinctly alutaceous, the punctures moderate in size, not closely placed, separated by at least their own diameters. Elytra a little wider at base than the thorax, humeri rounded, umbone not prominent, disc convex, the striæ regular, not impressed, composed of rather coarse and moderately closely placed punctures, the intervals all flat, wider than the striæ, without interstitial punctures, surface not alutaceous. Body beneath piceous, with slight brassy bronze. Prosternum closely punctate, the side pieces with few punctures. Abdomen moderately, coarsely, but not closely punctate. Femora piceous, bronzed, tibiæ and tarsi rufotestaceous. Length .10—.11 inch.; 2.5—2.8 mm.

This species varies in form, and in its narrowness approaches *subcylindrica*, while the usual form is obtusely fusiform. The color is usually coppery bronze and varies to brassy. A specimen from Garland, Colorado, has the thorax distinctly cupreous and the elytra greenish bronze.

Dr. LeConte describes the thorax as not narrowed in front, but the specimens are all narrower at apex than at base, but not very greatly.

Occurs in Colorado (Veta Pass and Garland), Detroit, and at Deer Park, Maryland.

6. **C. brunnescens** n. sp.—Oblong oval, moderately convex, pale reddish brown, the surface with faint æneous lustre. Antennæ pale rufotestaceous. Head alutaceous, with moderate punctures rather closely placed, the clypeofrontal region more coarsely punctate. Thorax rather more than twice as wide as long, narrowed in front, sides arcuate, basal marginal line entire, fine, containing fine punctures, surface alutaceous, the punctures coarse, close and very regularly placed. Elytra not wider at base than the thorax, humeri broadly rounded, umbone smooth, not prominent; the striæ slightly impressed on the disc, more deeply at the side, punctures moderate, closely placed, intervals lightly convex, scarcely wider than the striæ, the interstitial punctures distinct,

surface not distinctly alutaceous. Body beneath paler than above. Prosternum not densely punctate, side pieces smooth. Abdomen very sparsely punctate, smooth. Legs entirely pale rufotestaceous. Length .07 inch.; 1.75 mm.

The punctuation of the head in this species is as distinctly pronounced, if not relatively more so than in any species in our fauna.

It is easily known by its rather unusual color, which is not, however, due to immaturity.

Occurs at Key West, Florida (Schwarz).

7. **C. denticulata** Illig.—Form irregularly oval, facies robust, surface brightly bronzed, slightly brassy. Antennæ rufotestaceous at base, the outer five or six joints piceous Head alutaceous, opaque, the punctures moderate, or even small, not closely placed, those of the clypeo-frontal region coarser and densely placed. Thorax very nearly twice as wide at base as long, the sides regularly arcuately narrowing to the apex, basal marginal line feeble at the sides, surface distinctly alutaceous, the punctures moderate, not closely placed. Elytra not wider at base than the thorax, very nearly continuing the curve, umbone not prominent, disc convex, the punctures coarse and deep, not densely placed, except in the lateral striæ, scutellar stria usually irregular, intervals flat, wider than the striæ, with a row of distant fine punctures, lateral intervals slightly convex. Body beneath piceous, slightly bronzed. Prosternum coarsely punctured, the side pieces slightly wrinkled near the margin, rarely with a few punctures. Abdomen moderately, coarsely, not closely punctate. Anterior and middle femora brown, posterior piceous bronzed, the tibiæ and tarsi rufotestaceous. Length .08—.10 inch.; 2—2.5 mm.

Notwithstanding the wide distribution of this species it seems to vary but little. The punctuation of the head is never very coarse, nor is it ever indistinct. In some specimens the thorax has a narrow, smooth space along the median line near the base.

Occurs from the New England States to Florida, Texas and Montana, also in California.

8. **C. cribrifrons** Lec.—Form regularly oval, but more elongate than in *denticulata*, surface dark bronze, moderately shining. Antennæ brownish at base, the outer joints piceous. Head faintly alutaceous, the punctures sharply impressed, not large nor closely placed, the clypeo-frontal region more shining, the punctures coarse, deep and well spaced. Thorax nearly twice as wide at base as long, sides feebly arcuately narrowed to front, basal marginal line distinct at the sides, surface slightly alutaceous, the punctures moderate in size, rather closely, but not densely placed, a little coarser toward the sides. Elytra not wider at base than the thorax, the curve nearly continuous, umbone not convex, punctures arranged in regular striæ, which are not impressed, coarse, deep and closely placed, but not serrate, intervals all flat, wider than the striæ, each with a series of fine punctures visible only near the base. Body beneath piceous, slightly bronzed. Prosternum coarsely punctured, the side pieces smooth. Abdomen coarsely, sparsely punctate, the last segment more closely. Anterior and middle femora brown, posterior piceous bronzed. Tibiæ and tarsi rufotestaceous. Length .09—.11 inch.; 2.25—2.75 mm.

This species differs particularly from all those with punctate head by the punctures of the clypeo-frontal region being very coarse and deep, but well spaced. The only species with which it might be confounded is *denticulata*, which is, however, a broader species.

Occurs in Colorado, Texas, Dakota, Georgia and California (Ulke).

9. **C. pinguis** Lec.—Oval, slightly oblong, nearly twice as long as wide, surface feebly shining, distinctly alutaceous and bronzed. Antennæ rufotestaceous at base, the outer joints piceous. Head subopaque, sparsely finely punctate, clypeo-frontal space more coarsely punctured. Thorax nearly twice as wide at base as long, sides regularly arcuately narrowed to the front, basal marginal line very feeble, surface distinctly alutaceous, punctures fine not close. Elytra not wider at base than the thorax, the margin very nearly continuous with that of the thorax, umbone not distinct, disc finely striato-punctate, the punctures small, moderately close not deeply impressed, the intervals much broader than the striæ, flat on the disc, slightly convex at the sides, without distinct interstitial punctures, surface very distinctly alutaceous, inflexed margin with a row of closely placed punctures along the inner border. Body beneath piceous, shining, feebly bronzed. Prosternum closely punctate, side pieces smooth. Abdomen sparsely, indistinctly punctate, the last segment more coarsely and closely at the sides. Anterior and middle femora brown, posterior piceous, bronzed, tibiæ and tarsi rufotestaceous. Length .08–.09 inch.; 2—2.5 mm.

This species is very like a small *denticulata*, but differs in having the entire punctuation of the surface finer and less deep, more especially in the elytral striæ. The feebly punctate head makes this species a natural intermediate between those with the head decidedly punctate or smooth.

Occurs in Florida, North Carolina and Texas.

10. **C. æmula** n. sp.—Oval, rather robust, surface shining, slightly brassy. Antennæ rufotestaceous at base, piceous externally. Head alutaceous, sparsely, finely punctate, clypeo-frontal region very distinctly, not densely punctate. Thorax one-half wider than long, widest a little in front of base, sides arcuately narrowing to the front, basal marginal line very indistinct at the sides, surface indistinctly alutaceous, the punctures rather fine, closely placed, but not dense. Elytra a little wider at base than the thorax, humeri broadly rounded, umbone not evident, striæ slightly impressed, the punctures moderately coarse, close and deep, the intervals very little wider, very slightly convex on the disc, more so at the sides, the interstrial punctures indistinct and very fine. Body beneath piceous black, slightly bronzed. Prosternum coarsely punctured, the side pieces smooth. Abdomen coarsely, but sparsely punctate. Femora piceous, tibiæ and tarsi rufotestaceous. Length .09 inch.; 2.25 mm.

This species presents nothing remarkable. The head is finely and indistinctly punctate as in *pinguis*, but the elytral striæ are comparatively coarsely punctured The regularity of the oval outline is

interrupted at the humeri in this species, while in *cribrifrons* and *pinguis*, with which it is most closely related, the outline is continuous.

Occurs in Arizona, probably Fort Thomas; represented by one specimen only.

11. **C. opacula** Lec.—Oval slightly oblong, moderately robust, dark greenish bronze, very feebly shining. Antennæ with basal joints brownish, the outer piceous. Head very opaque, sparsely, indistinctly punctate. Thorax about one-half wider than long, distinctly narrowed in front, sides regularly arcuate, widest at base, basal marginal line indistinct, but with punctures coarser than the discal, forming an irregular series, discal punctures rather fine, feebly impressed, moderately closely placed, the surface opaque. Elytra a little wider at base than the thorax, humeri distinct, umbone smooth, moderately prominent, striæ scarcely impressed, composed of moderately coarse, closely placed subtransverse punctures, the intervals scarcely wider, not convex, more shining than the thorax, indistinctly punctulate. Body beneath piceous, slightly bronzed. Prosternum coarsely punctate, side pieces smooth. Abdomen subopaque, coarsely, sparsely punctate at the sides, smoother at middle. Femora piceous, tibiæ and tarsi brown. Length .06 inch.; 1.5 mm.

Although quite different in appearance from *minuta*, it is difficult to separate it by description. The characters given in the table, supplemented by the description, will enable separation to be made.

A specimen which I am at present unwilling to separate from this species, in Mr. Schwarz's collection from Alamosa, Colorado, has much more shining elytra and the basal punctures of the thorax less distinct.

Occurs in California (Gilroy) and Colorado?

12. **C. minuta** Mels.—Oval, facies very robust, piceous, surface distinctly bronzed, shining. Antennæ with four basal joints brownish testaceous, the outer piceous. Head distinctly alutaceous, sparsely, indistinctly punctate. Thorax twice as wide as long, evident at middle, scarcely narrower at apex than base, sides arcuate, disc very faintly alutaceous, the punctuation sparse and fine, basal row of punctures distinct and a little more in front of basal margin than usual, and coarser than those of the disc. Elytra distinctly wider at base than the thorax, humeri broadly rounded, umbone smooth, not prominent, striæ faintly impressed, the punctures moderate in size, rather closely placed, a little transverse, intervals feebly convex, very slightly alutaceous, not visibly punctulate, wider than the striæ. Body beneath piceous black, faintly bronzed. Prosternum closely punctate, the side pieces smooth. Abdomen sparsely punctate. Legs piceous, the tibiæ and tarsi sometimes paler. Length .08 inch.; 2 mm.

This species escaped the notice of LeConte and Crotch. Fortunately, the type in the Museum at Cambridge is in good condition, and the above description has been taken from it in comparison with other specimens.

By its indistinctly punctate head it resembles *æmula*, which has no basal marginal row of punctures. *C. parcepunctata* also closely resembles it, but the head is entirely devoid of punctures, but it is possible that future collections may make it necessary to unite them.

Specimens have been seen from Pennsylvania, Maryland, North Carolina, Florida and Arizona, and Garland, Colorado.

13. **C. alutacea** Crotch.—Oval, rather robust, surface subopaque, olive-green bronze, very distinctly alutaceous. Antennæ with basal and five outer joints piceous, the others pale. Head impunctate. Thorax one-half wider than long, very little narrowed in front, sides arcuate, base a little coarctate, basal marginal line distinct and entire, surface alutaceous, the punctures coarse, deep and close at the sides, less so at middle. Elytra not wider at base than the thorax, humeri obliquely rounded, umbone not prominent, but smooth; striæ distinctly impressed, composed of coarse, deep and closely placed punctures, these, however, wider, slightly convex, each with a row of very fine punctures. Body beneath piceous, faintly bronzed. Prosternum closely punctate, the side pieces entirely smooth. Abdomen sparsely punctate. Legs entirely piceous. Length .06—.08 inch.; 1.5—2 mm.

This species is one of the most readily known. Its quite opaque surface, coarse sculpture and entirely piceous legs separate it very easily from any other. In consequence of the thorax being slightly coarctate at base the marginal line of the body is not continuous from the thorax to the elytra.

Occurs from northern Georgia to Florida.

14. **C. subviridis** Lec.—Oval, robust, surface shining, bright green bronze or slightly bluish. Antennæ with basal joints rufotestaceous, tipped with brown, the outer seven joints piceous. Head finely alutaceous, a punctured fovea near each eye. Thorax fully twice as wide as long, narrower at apex, sides feebly arcuate, basal marginal line fine and entire, surface alutaceous, but not well marked, the punctures coarse, deep and close, a smoother median line near the base. Elytra not wider at base than the thorax, humeri obliquely rounded, umbone moderately prominent and smooth, striæ finely impressed, the punctures relatively free, not coarser than those of the thorax, closely placed, intervals slightly convex, wider than the striæ, distinctly punctulate, subbiseriately near the base. Body beneath piceous, with slight blue or greenish tinge. Prosternum punctate, the side pieces smooth. Abdomen not coarsely, but rather closely punctate, except at the middle of the last segment. Femora piceous, bronzed, tibiæ brown at apex, pale at base, tarsi brown. Length .08—.14 inch.; 2—3.5 mm.

This species is the largest at present known in our fauna, and by that and the usually bright green surface may be readily known.

Specimens do, however, occur with a bluish or slightly cupreous surface. Two specimens are before me from Colorado with the thorax not more coarsely punctate than in *denticulata*, but these are considered merely variations. In the majority of specimens the scutellar stria is slightly irregular. The posterior thighs are elongate oval, nearly twice as long as broad.

Occurs in Kansas, Colorado, Montana, Arizona and California (Owen's Valley).

15. **C. opulenta** n. sp.—Oval, moderately convex, surface not alutaceous, bright golden or brassy bronze. Antennæ rufotestaceous at base, gradually darker to tip. Head slightly alutaceous and feebly wrinkled. Thorax twice as wide as long, narrowed at apex, sides regularly arcuate, basal marginal line entire and well marked, the surface coarsely, deeply and closely punctate. Elytra a little wider at base than the thorax, humeri rounded, umbone smooth, not prominent, striæ feebly impressed, the punctures very coarse and deep, closely placed, the intervals slightly convex, more so at the sides, not wider than the striæ, distinctly punctulate. Body beneath distinctly æneous. Prosternum closely punctate, side pieces smooth. Abdomen sparsely punctate, last three segments smooth at middle. Femora piceous, the tibiæ and tarsi testaceous. Length .08—.10 inch.; 2—2 5 mm.

Closely resembles *subviridis*, but may be known by the color, the distinctly wrinkled head, the coarser elytral punctures with narrower intervals and by the very pale tibiæ and tarsi. The scutellar stria is always regular. The posterior thighs are strongly incrassate, the width being nearly three-fourths the length.

Occurs in California (Owen's Valley) and western Nevada, also New Mexico (Ulke).

16. **C. obesula** Lec.—Oval, moderately robust, black bronzed, rather shining. Antennæ reddish brown at base, piceous externally. Head extremely finely alutaceous, impunctate. Thorax nearly twice as wide at base as long, ar cuately narrowed to apex, surface extremely finely alutaceous, not visibly punctate, the basal marginal line fine and entire, the punctures at the side relatively coarse and distant. Elytra wider at base than the thorax, humeri rounded, umbone distinct, disc convex, shining, not alutaceous, striæ finely impressed, the punctures relatively coarse, deep and close, the intervals wider than the striæ, very slightly convex with a row of distant, interstrial punctures. Body beneath black, shining. Abdomen very indistinctly punctate. Femora piceous, tibiæ and tarsi pale. Length .05 inch.; 1.25 mm.

This species is one of the smallest in our fauna, and is especially characterized by the impunctate thorax and almost truly black color.

Occurs at Enterprize and Lake Ashby, Florida.

17. **C. ectypa** n. sp.

This species resembles *obesula* so closely that the following differences only need be given:

Surface distinctly æneous. Antennæ rufotestaceous at base, the five outer joints piceous. Thorax distinctly alutaceous, the punctuation extremely fine, indistinct and sparse, the basal marginal line consists of fine, closely placed punctures. Anterior and middle femora brown, the posterior femora piceous, tibiæ and tarsi rufotestaceous. Length .06 inch.; 1.5 mm.

Occurs at Los Angeles, California, also in Arizona.

18. **C. parcepunctata** Crotch.—Oval, robust, surface æneous, shining. Antennæ rufotestaceous at base, piceous externally. Head finely alutaceous, impunctate. Thorax nearly twice as wide as long, scarcely narrowed in front, sides arcuate, basal marginal row of punctures distinct, but somewhat irregular, disc indistinctly alutaceous or even smooth, the punctures fine, sparse and indistinct. Elytra distinctly wider at base than the thorax, humeri rounded, umbone moderately prominent and smooth, the striæ not distinctly impressed, the punctures large, round and moderately closely placed, intervals scarcely wider than the striæ, shining, not punctulate. Body beneath distinctly æneous. Prosternum punctate between the coxæ, smooth in front and at the sides, side pieces smooth. Abdomen sparsely and indistinctly punctate. Femora piceous, the tibiæ and tarsi brownish or rufotestaceous. Length .06 inch.; 1.5 mm.

As already stated this species is closely related to *minuta* in form, size and color, the sculpture is also nearly identical, except that here the head is impunctate. As a rule the thorax here is more distinctly punctate.

Occurs in Massachusetts (Blanchard), Pennsylvania, Maryland, North Carolina, Florida and Texas.

19. **C. pulicaria** Mels.—Oval, slightly oblong, convex, surface shining, with faint greenish bronze lustre. Antennæ with three or four basal joints rufotestaceous, the outer piceous. Head alutaceous, impunctate. Thorax one-half wider at base than long, distinctly narrowed in front, sides very feebly arcuate, slightly obliquely truncate at the front angles, basal marginal line distinct, closely punctured from the sides nearly to middle, surface distinctly alutaceous and subopaque, the punctures fine, feebly impressed and sparsely placed. Elytra a little wider at base than the thorax, humeri rounded, umbone smooth, distinct, the striæ faintly impressed, the punctures relatively coarse, closely placed, not crenate, the intervals slightly convex, very little wider than the striæ, surface smooth, with an indistinct series of fine punctures. Body beneath piceous black, faintly bronzed. Prosternum punctate, side pieces smooth. Abdomen sparsely punctate. Femora piceous, tibiæ and tarsi brownish testaceous. Length .06 inch.; 1.5 mm.

In this species the legs vary a little in color, the anterior and middle femora being sometimes brown, in which case the tibiæ and tarsi

are rufotestaceous. The thorax has a slight intimation of an oblique truncation in front, but there is no post-apical angulation. *C. æneola* Lec. does not differ specifically from *pulicaria*.

Specimens have been seen from Pennsylvania, Maryland, North Carolina, Texas and Colorado.

20. **C. crenulata** Crotch.—Form oval, convex, robust, the thoracic and elytral margins almost exactly continuous, piceous, faintly bronzed, shining. Antennæ rufotestaceous Head extremely finely alutaceous, impunctate. Thorax twice as wide at base as long, distinctly narrowed in front, sides feebly arcuate, the basal marginal line distinct, defined by a row of closely placed, fine punctures, the disc very distinctly alutaceous, the punctures coarse, deep, sparsely and rather irregularly placed. Elytra not wider than the thorax at base, humeri smooth, not prominent, striæ scarcely impressed, the punctures large, deep and moderately closely placed, intervals wider than the striæ, shining, slightly convex, very indistinctly uniseriately punctulate. Body beneath piceous black, faintly bronzed. Prosternum smooth, the side pieces smooth. Abdomen not distinctly punctate, except at the sides of the last segment. Femora piceous, bronzed, tibiæ and tarsi rufotestaceous. Length .06—.08 inch.; 1.5—2 mm.

This species is noteworthy in having the coarse punctures of the thorax rather unequally placed, and the prosternum smooth.

Occurs in North Carolina, Georgia and Florida.

21. **C. confinis** Crotch.—Rather broadly oval and of robust facies, piceous, slightly æneous. Antennæ rufotestaceous. Head faintly alutaceous, impunctate. Thorax twice as wide as long, distinctly narrowed in front, anterior angles obliquely truncate, a distinct post-apical angulation, behind which the sides are feebly arcuate, disc distinctly alutaceous, without basal marginal line, the punctures of moderate size, closely, but not densely placed, not deeply impressed. Elytra scarcely wider at base than the thorax, humeri rounded, umbone moderate, the striæ impressed on the disc, more deeply at the sides, the punctures relatively coarse, close and deep, but not serrate, intervals slightly convex, wider than the striæ on the disc, but not at sides, surface smooth, shining, with fine interstrial punctures. Body beneath piceous black, shining. Prosternum punctate, side pieces smooth. Abdomen sparsely indistinctly punctate. Anterior and middle legs and posterior tibiæ and tarsi rufotestaceous, posterior femora piceous. Length .06 inch.; 1.5 mm., a little larger and smaller.

This species varies a little in form and somewhat in the distinctness of the thoracic punctures.

After an examination of *flavicornis* I can find no reason to separate it from the present species. The basal puncture, of which Dr. LeConte wrote, is an optical deception, caused by a slight impression close to and along the basal margin, which looks punctiform when seen from above.

Occurs from Pennsylvania to Florida, Michigan, Colorado, Dakota and California (Mendocino).

22. **C. elongatula** Crotch.—Oval, slightly oblong, moderately convex, surface with slight æneous lustre. Antennæ rufotestaceous, very slightly darker to the tip. Head distinctly alutaceous, impunctate. Thorax nearly twice as wide at base as long, distinctly narrowed in front, the anterior angles obliquely truncate with a post-apical angulation, sides thence to base regularly arcuate, basal marginal line extremely fine, disc very distinctly alutaceous, the punctures rather coarse and deep, moderately close, but separated by their own diameters. Elytra very little wider at base than the thorax, the humeri rounded, umbone moderately prominent and smooth, disc with distinctly impressed striæ, the punctures relatively fine, seriately placed, the intervals broader than the striæ, slightly convex and with a row of extremely fine punctures. Body beneath piceous black, shining. Prosternum coarsely, closely punctate, the side pieces smooth. Abdomen very sparsely punctate, slightly wrinkled transversely. Anterior and middle femora brown, the posterior piceous, tibiæ and tarsi rufotestaceous. Length .06—.08 inch.; 1.5—2 mm.

This species is not unlike some of the smaller forms of *denticulata*. The small number of species in which the thorax is narrowed in front and the anterior angles obliquely truncate renders them easily separable.

Occurs in Kansas, Colorado and Dakota.

23. **C. dispar** n. sp.—Oval, slightly oblong, surface piceous, moderately shining, with scarcely a trace of bronze lustre. Antennæ entirely rufotestaceous. Head finely alutaceous, impunctate. Thorax twice as wide as long, distinctly narrowed in front, anterior angles obliquely truncate with a post apical angle, the sides thence to base arcuate, basal marginal line fine, but distinct, surface very distinctly alutaceous, the punctures moderately coarse, very closely placed, but not deeply impressed. Elytra not wider at base than the thorax, the margin nearly continuous, umbone feeble, disc deeply striate, the striæ relatively coarsely, crenately punctured, the intervals convex, narrower than the striæ, interstrial punctures not distinct. Body beneath piceous black, shining. Prosternum punctate, the side pieces entirely smooth. Anterior and middle femora brownish testaceous, posterior piceous, paler at tip; tibiæ and tarsi all rufotestaceous. Length .06 inch.; 1.5 mm.

This is one of the smallest species in our fauna. It is readily known among those with truncate thoracic angles by the deep, crenately punctured striæ.

Occurs in northern Georgia (Morrison).

24. **C. quadricollis** Schwarz.—Form oval, not very convex, piceous black, with faint æneous lustre. Antennæ entirely rufotestaceous. Head alutaceous, impunctate. Thorax nearly twice as wide as long, very obliquely truncate at the front angles, the sides behind the angulation nearly straight and slightly convergent to base, the basal marginal line distinct, entire, disc distinctly alutaceous, the punctures feebly impressed and not closely placed. Elytra wider at base than the thorax, humeri rounded, umbone moderately prominent and smooth, striæ slightly impressed, the punctures moderate in size and closely

placed, intervals wider than the striæ, slightly convex, each with a series of distant fine punctures, surface not alutaceous. Body beneath piceous shining. Prosternum punctate, the side pieces smooth. Abdomen sparsely, indistinctly punctate. Legs usually entirely pale rufotestaceous, the posterior femora sometimes slightly darker. Length .06—.08 inch.; 1.5—2 mm.

Easily known by the transversely quadrate thorax, obliquely truncate front angles, the pale antennæ and legs.

Occurs in Florida (Enterprise, New Smyrna, Biscayne Bay).

25. **C. decipiens** Lec.—Oval, less convex, surface dark greenish bronze, shining. Antennæ rufotestaceous at base, the outer joints piceous. Head quite shining, impunctate, not distinctly alutaceous. Thorax twice as wide as long, anterior angles obliquely truncate, the sides behind the angulation feebly arcuate and slightly narrowed to base, basal marginal line feebly distinct near the sides only, surface rather shining at middle in front, alutaceous at the sides and base, the punctuation fine and indistinct on the smoother space closer and deeper near the sides and base. Elytra a little wider at base than the thorax, humeri rounded, umbone feeble, the striæ moderately impressed, the punctures relatively coarse, closely placed and deep, the intervals slightly convex, rather narrower than the striæ, smooth, not alutaceous. Body beneath black, shining. Prosternum shining, not distinctly punctate, side pieces smooth. Abdomen nearly smooth. Femora piceous, tibiæ and tarsi rufotestaceous. Length .06 inch.; 1.5 mm.

This species resembles *quadricollis*, but has the sides of thorax more distinctly arcuate, the basal line feeble, abdomen smoother and the antennæ and legs differently colored.

Occurs in Kansas.

Group XIV.—SYSTENÆ.

Antennæ 11-jointed. Thorax without a distinctly impressed line. Anterior coxal cavities closed behind. Ventral segments free. Posterior tibiæ faintly sulcate, these alone with a terminal spur. Claws appendiculate.

This group contains genera which have heretofore made part of the Crepidoderæ. While it is already difficult to sharply define the groups into which the Halticini have been divided, part of the difficulty in several instances has resulted from the association of heterogeneous material. To define a group as possessing an ante-basal impression and include in it genera without it is unnatural, unscientific and confusing.

It is possible that Clamophora and Prasona should form part of this group. In our fauna we have Systena alone.

SYSTENA Clark.

Head inserted as far as the eyes, front with very feeble frontal carina and tubercles. Antennæ slender, half as long as the body, slightly thicker toward the tip, fourth joint longer than third or fifth. Maxillary palpi comparatively slender, the last joint acuminate and longer than the preceding. Prothorax transversely quadrangular, very little narrowed in front, margin very narrow, sides feebly arcuate, anterior angles usually obliquely truncate, hind angles acute, disc often broadly, but vaguely impressed in front of base; coxæ narrowly separated, the cavities closed behind, angulated externally, the trochantin visible. Elytra usually wider at base than the thorax, humeri obtuse. Legs rather slender, the posterior tibiæ grooved on the outer edge and carinate, terminated by a single spur. Claws appendiculate.

The base of the thorax is usually feebly, regularly arcuate, occasionally near the hind angles the base is slightly oblique as in Disonycha. The ante-basal impression is vague at best, but many specimens occur in every species in which it is entirely obliterated.

In his generic description Chapuis states that the posterior tibiæ are not grooved. Quite the contrary will be observed in our species. There is not only a groove from the apex upward, but the edge of the tibia forms a carina along the middle of this groove, especially observable in the larger species. In *marginalis*, however, the groove is short and apical and in *senilis* it is entirely absent. The latter is the only species in which there is an ante-basal impression, which is, however, shallow and vague.

The species occur in every part of our territory, each rather widely spread. They are not numerous and easily known by the characters of the following table:

Elytra uniformly piceous or dark brown, slightly bronzed, or bright blue.....2.
Elytra vittate, or testaceous .....7.
2.—Legs piceous, or black .....3.
Legs rufotestaceous; thorax reddish brown .....6.
3.—Thorax black .....1.
Thorax reddish yellow .....5.
4.—Head entirely black .....**hudsonias.**
Head rufotestaceous .....**frontalis.**
5.—Head black, elytra slightly bluish .....**collaris.**
6.—Elytra brown bronze.
Elytral punctuation sharply defined and closely placed .....**subænea.**
Elytral punctuation coarse and confused, not well defined .....**pallipes.**
Elytra bright blue; posterior tibiæ not at all grooved .....**senilis.**

7.—Genæ very coarsely punctate..... **elongata.**
Genæ smooth.....8.
8.—Surface shining, the punctuation never very coarse; posterior tibiæ indistinctly grooved near apex..... **tæniata.**
Surface subopaque, the punctuation coarse, close and deep... **marginalis.**

S. hudsonias Forst.—Form elongate, subdepressed, piceous black, shining. Antennæ slender, as long as half the body, two basal joints piceous, 3–4–5 testaceous, the outer joints gradually darker. Head indistinctly alutaceous, sparsely punctate. Thorax about one-third wider than long, scarcely narrowed in front, sides feebly arcuate, margin narrowly reflexed, front angles obliquely truncate, disc moderately convex, slightly alutaceous, indistinctly punctate, somewhat scabrous. Elytra wider at base than the thorax, humeri obtuse, disc rather coarsely and closely punctate, surface shining. Body beneath more shining and smooth than above, abdomen very sparsely punctate. Legs black. Length .18 inch.; 4.5 mm.

The male has the last ventral segment notched each side, the middle lobe triangularly impressed with a deeply impressed short median line.

This species is so common and well known as to need no further comment. It is the only one in our fauna totally black.

Occurs over the entire region east of the Rocky Mountains.

S. frontalis Fab.—Similar in form to *hudsonias*, but a little broader, piceous black, less shining, head rufotestaceous. Antennæ as in *hudsonias*. Head sparsely, indistinctly punctate. Thorax one third wider than long, slightly narrowed in front, sides slightly arcuate, margin narrowly reflexed, anterior angles obliquely truncate, disc moderately convex, alutaceous, coarsely not closely punctate. Elytra wider at base than the thorax, humeri rounded, surface closely and moderately coarsely punctate. Body beneath more shining than above, abdomen very sparsely punctate. Legs piceous. Length .14—.20 inch.; 3.5—5 mm.

The male sexual characters are very like those of *hudsonias*.

While closely related to *hudsonias*, it is, apart from the color of the head, distinguished by its rather broader form; elytral punctuation less coarse, but rather more dense.

Occurs with *hudsonias*. As a rule the specimens from the Canadian region are smaller than those from the Southern States.

S. collaris Crotch.—Oblong, rather parallel, subdepressed, piceous, moderately shining, thorax yellowish red. Antennæ half as long as the body, piceous, joints 3 and 4 and the underside of first and second pale. Head piceous, front yellow, a few scattered, rather fine punctures on the sides of vertex. Thorax one half wider than long, very little wider at base than apex, widest one-third from the front angles, sides moderately arcuate, margin narrowly reflexed, front angles obtuse, disc moderately convex, smooth, with a few scattered fine punctures. Elytra wider at base than the thorax, humeri obtuse, disc finely and not

closely punctate, smoother at sides and apex, surface with slight æneous lustre. Body beneath piceous black, shining; abdomen with a few scattered punctures with short hairs. Legs piceous, the bases of the anterior and middle femora usually paler. Length .14—.18 inch.; 3.5—4.5 mm.

The sexual characters of the male are similar to those of *hudsonias*, but the middle lobe is rather longer and the longitudinal impression extends the entire length of the segment.

A very easily known species, which shows no variation, except in size. The ante-basal impression is, however, in some specimens entirely obliterated.

Occurs in southwestern Texas.

S. senilis Say.—Moderately elongate and convex, occiput piceous, thorax fuscotestaceous, elytra bright blue. Antennæ slender, half as long as the body, brownish, the basal joints paler. Head smooth, occiput piceous, front and mouth pale. Thorax nearly twice as wide at middle as long, not narrowed in front, sides regularly arcuate, slightly sinuate posteriorly, the hind angles slightly prominent as in *tæniata*, disc convex, a vague ante-basal impression, surface minutely alutaceous, punctuation very minute and sparse, color pale brownish testaceous, a vague darker cloud each side. Elytra distinctly wider at base than the thorax, humeri obtuse, umbone distinct, limited within by a slight depression, color bright blue, shining, moderately closely punctate, epipleuræ pale. Prothorax beneath and legs rufotestaceous, posterior femora darker. Metasternum piceous. Abdomen brown, sparsely punctate and slightly pubescent. Length .14—.16 inch.; 3.5—4 mm.

The last ventral of the male is broadly truncate and flattened.

This insect with *Malacosoma fuscula* Lec. were made the representatives of a new genus—Luperaltica—by Crotch, which was defined in such a manner that it cannot contain either, and must therefore be dropped from our literature. As the form and coloration resemble *S. collaris* it is rather remarkable that the affinities of *senilis* should have escaped Crotch.

Occurs from Pennsylvania to Illinois.

S. subænea Lec.—Form oblong, rather more oval than *hudsonias*, moderately convex, piceous, with very distinct æneous surface lustre, head and thorax brownish. Antennæ half as long as the body, rufotestaceous, two basal joints darker. Head brownish, coarsely not closely punctate, front paler. Thorax one-third wider than long, not narrow at apex, widest one third from apex, sides moderately arcuate, margin very narrow, front angles obliquely truncate, disc moderately convex, ante-basal impression not evident, surface coarsely, deeply and moderately closely punctate. Elytra scarcely wider at base than the thorax, humeri obtusely rounded, disc more finely and densely punctured than the thorax. Body beneath piceous, abdomen alutaceous, sparsely punctate. Legs testaceous, posterior femora brown. Length .14—.16 inch.; 3.5—4 mm.

The last ventral of male is emarginate each side, the middle lobe moderately prominent, slightly concave, a moderately deep longitudinal impression extending nearly to the base.

By its pale legs and antennæ, and the distinct, sharp punctuation, this species is easily known. The genæ are slightly rugulose and punctate, but not so well marked as in *elongata*.

Occurs in California and Nevada.

S. pallipes Schwarz.—Similar in form and coloration to *subænea*, but rather more elongate and without the æneous surface lustre. Antennæ half as long as the body, rufotestaceous, the terminal four or five joints piceous. Head very sparsely and finely punctate. Thorax about one-fourth wider than long, not wider at base, sides nearly straight, margins very narrow, anterior angles obliquely truncate, disc moderately convex, indistinctly alutaceous, sparsely, obsoletely punctate. Elytra scarcely wider at base than the thorax, humeri obliquely rounded, surface slightly wrinkled, indistinctly coarsely punctate. Body beneath brownish, abdomen very sparsely punctate. Legs entirely yellowish testaceous. Length .12—.14 inch.; 3—3.5 mm.

The last ventral of the male is lobed at middle as usual, flat and with a longitudinal impressed line extending the entire length of the segment.

This species is related to *subænea*, but has no æneous lustre, and the punctuation of the surface very indistinct. The legs are entirely pale, the genæ smooth.

Occurs in Georgia and Florida.

S. elongata Fab.—Elongate oval, moderately convex, piceous, surface with slight æneous lustre, each elytron with a yellow vitta reaching nearly to the apex. Antennæ half as long as the body, brownish. Head dark brown, coarsely and closely punctate, the genæ coarsely and deeply punctate. Thorax one-fourth wider than long, slightly narrowed at apex, sides slightly arcuate, margin narrow, anterior angles slightly obliquely truncate, disc rather coarsely and closely punctate. Elytra distinctly wider at base than the thorax, humeri rounded, surface more finely and sparsely punctate than the thorax, the yellow vitta is nearly in the middle of each elytron, and extends nearly to apex. Body beneath piceous, abdomen sparsely, finely punctate. Anterior and middle legs and posterior tibiæ reddish, the posterior femora piceous. Length .12—.16 inch.; 3—4 mm.

The male characters are a repetition of those of *subænea*.

This species is the only one known to me in which the sides of the head beneath and in front of the eyes are coarsely punctate and rugulose. It is also remarkable for the constancy of its general characters, while our other vittate species varies excessively.

Occurs in Georgia and South Carolina.

S. tæniata Say.—Form of *elongata*, but narrower, surface shining. Color very variable, but even when entirely pale, the elytra show traces of the vittæ by the paler color of the yellowish white. Pl. VII, figs. 5—8, varieties.

This species is best described by giving a brief description of the varieties, or at least of certain forms which have been indicated as distinct, while it must be remembered that these intergrade so gradually as to be inseparable.

ligata Lec.—Head moderately, coarsely, sparsely punctured. Thorax more coarsely deeply and closely punctate. Elytra moderately closely and deeply punctate, the punctures finer than those of the thorax. Color piceous, antennæ and legs brown, elytra with a median yellow vitta reaching nearly to the apex. Length .12—.15 inch.; 3—4 mm.

Under this style of punctuation the color varies. The head and thorax become reddish brown, others have pale epipleuræ, the side margin becomes pale and finally the whole surface is pale yellowish white and form the variety *ochracea* Lec.

This variety occurs in California and Nevada, going as far south as San Bernardino.

Variety * * * * * Rather more elongate than the preceding form and with the punctuation as abundant, but less deep. Length .12—.16 inch.: 3—4 mm.

The feebly colored forms of this type resemble *elongata*, and from this it varies in the manner indicated for *ligata* until the specimens are entirely yellowish white above and beneath.

This form occurs in Dakota, Colorado and northern Arizona.

blanda Mels.—Punctuation of thorax fine and sparse, that of the elytra fine and moderately close, but not deep. Length .12—.18 inch.; 3—4.5 mm.

This variety is not often so dark as the preceding. It varies in color to entirely pale. Forms with the underside of body and sides of thorax narrowly piceous constitute the true *blanda* Mels.

This variation is common in Dakota, Kansas, Colorado and New Mexico, extending to Pennsylvania and New England States.

mitis Lec.—Of the same form as the preceding. Thorax almost absolutely smooth, elytral punctuation fine and feeble, sometimes the elytra are quite smooth. Length .12—.16 inch.; 3—4 mm.

This variety goes through all the forms from those colored like *elongata* to others entirely pale.

Occurs abundantly in Nevada, California and southern Arizona.

In the vast majority of the darker specimens the thorax has at base a broad paler band. The male has the last ventral of the usual trilobed form, the middle lobe flat or slightly concave, with a finely impressed median line.

This species has cost me a vast amount of study and trouble. It has been studied from every point and the conclusion has been reached that all the forms mentioned constitute one excessively variable species.

For convenience of study I have arranged the specimens in series in which the general punctuation has been taken as the initial point, beginning with those most coarsely punctured, arranging in a vertical series down to those almost absolutely smooth.

In four or five arbitrary beginnings the first specimen chosen is fully colored. Then in a transverse line I have arranged the specimens by color, and in every case end with individuals of yellowish white color with the vittæ barely perceptible.

The name used for this species has generally been placed as a synonym of *Phyllotreta vittata*, but there can be no doubt as to what Say had before him from his mention of *S. elongata* in the description. The prominent or excurved hind angles of the thorax are especially mentioned, a character universal in Systena, but unknown in Phyllotreta.

In glancing over the localities for the various forms it will be observed that the species is an inhabitant of the northern half of our territory from the Atlantic to the Pacific, and from Oregon and Dakota to Arizona, extending to Mexico, where it has received several additional names.

In reviewing the species of Systena recorded from Mexico by Mr. Jacoby in Vol. VI, Part 1, of the "Biologia," it will be observed that *elongata* has been identified among the collections from Guatemala. From the known distribution of this species in our fauna it is highly probable that the species does not extend so far south.

On the other hand *discicollis*, *capitata* and *semivittata* seem to be varieties of the same and correspond with those indicated under *taeniata*. The latter species has long been known to me from many parts of Mexico.

S. marginalis Illig.—Elongate oval, rather depressed, yellowish testaceous, scarcely shining, sides of thorax and elytra narrowly brown or piceous. Antennæ half as long as the body, pale yellowish testaceous, the terminal half of the outer joints darker, the two basal joints brownish above. Head alutaceous, sparsely, regularly punctate, genæ smooth. Thorax one-third wider than long, not broader at base than the apex, sides regularly arcuate, margin very narrow, front angles obtuse, disc moderately convex, coarsely, not closely punctate, color pale yellow, the margin narrowly black or brown. Elytra distinctly wider at base than the thorax, humeri rounded, disc rather flat, a slight intra-

umbonal arcuate impression, moderately densely punctate, the punctures finer than those of the thorax, color pale yellowish white, sides piceous or brownish, which is gradually evanescent toward the apex. Body beneath and legs entirely pale yellow, abdomen sparsely, finely punctate. Length .14—.16 inch.; 3.5—4 mm.

The last ventral of male has the usual trilobed form, the middle lobe moderately produced, concave and with a smooth median line.

This species may be difficult to distinguish from the pale forms of *blanda*, but the surface is never shining and the elytral punctures denser. In the pale forms of *blanda* the vittate character of the species can always be distinguished.

Occurs from Massachusetts to Florida and westward to Missouri.

Group XV.—APHTHONÆ.

Form oval. Antennæ 11-jointed. Anterior coxal cavities open behind. Thorax without trace of basal impressions. Posterior tibiæ grooved at least near the apex and terminated by a moderately long spur. Mesosternum distinctly visible. Posterior tarsi with last joint not inflated, the claws simple.

These few characters are all which can be used to define the entire group. All the genera are represented in both our fauna and in Europe. They are as follows:

Posterior tibiæ with the apex entire, the spur placed in the middle in front of the tarsus.

First joint of hind tarsi nearly or quite as long as half the tibia; punctuation of elytra confused..... **Longitarsus.**

First joint of hind tarsus not more than one-third the length of the tibia and scarcely as long as the three following joints united; punctuation of elytra disposed in regular striæ..... **Glyptina.**

Posterior tibiæ with the inner apex notched or bilobed, the spur placed on the inner lobe.

First joint of hind tarsus not longer than one-third the tibia; punctuation of elytra in great part or entirely confused..... **Aphthona.**

After a study of our species of Glyptina in comparison with Batophila there does not seem to be any tangible character for separating them, and, as the former name has priority, has been adopted.

Aphthona is confined to the Atlantic region, the other genera are represented on both sides of the continent.

LONGITARSUS Latr.

Head oblong, not inserted as far as the eyes, front distinctly carinate and with the usual two tubercles distinctly separated and limited

above. Labrum truncate. Eyes oval, convex, entire. Maxillary palpi rather slender, second joint cylindrical, third obconical, fourth more slender, conical and acute at tip. Antennæ always longer than half the body, often nearly as long, slightly stouter at tip. Prothorax broader than long, not, or only apparently narrowed in front, sides arcuate, often oblique at the front angles, base arcuate, but sometimes feebly so. Elytra oval or oblong, usually convex, the humeri variable, sometimes entirely obliterated in the apterous species, surface variably punctate, but always in a confused manner. Prosternum narrow, slightly dilated behind, the coxal cavities broadly open. Legs moderately long. Posterior thighs robust and often attaining the apices of the elytra. Tibiæ as long as the femora, dilated toward the apex, the posterior broadly grooved on the outer edge and finely denticulate, terminated by a long curved spur. Tarsi slender, the first joint of the posterior pair nearly or fully half the length of the tibia and as long as all the following joints united (Pl. VII, fig. 14). Abdomen with five free ventral segments.

An important modification of the definition of the genus as given by Chapuis must be made in reference to the structure of the antennæ. The fourth joint is not always longer than the third, as a considerable number of our species have the joints 2–3–4 very nearly equal in length. This has afforded an important means of dividing the genus primarily as will be seen in the table. The other characters are sufficiently plain, and will not require special comment. It must, however, be observed that the colors are slightly variable, and the consequent determination of unique examples is attended with more or less uncertainty.

The sexual characters have been observed and recorded in several species. In nearly all the males have the first tarsal joint of the front and often the middle legs longer and broader than in the female. The last ventral of the male varies in its characters, and is sometimes sinuate each side with a median impressed lobe as in Systena, or again subtruncate with a slight longitudinal impression, or finally, simply more convex than in the female. The antennæ are often longer and stouter in the male; the sutural angle of the elytra in several species is more distinct in the male, broadly rounded in the female.

The genus is an extremely difficult one to deal with, certainly more so than any other Halticini of our fauna, and the attempts to reduce the species to some sort of tabular order has not been very

satisfactory, and the present one may prove no better than its predecessors, but the structure of the antennæ and the presence of certain apterous forms enables several divisions to be made, so that the difficulties are somewhat reduced.

Of but few species are the food plants known, these have been recorded in the specific names of the species themselves.

With these preliminary remarks the following table is presented:

Antennæ with joints 2–3–4 successively longer; body always winged.....2.
Antennæ with joints 2–3–4 of equal length, or at least with the fourth not longer than the second; body winged, or apterous.....12.
2.—Species rufotestaceous, brown or piceous; form always convex, except in *postremus* .....3.
Species yellowish white, or pale yellowish testaceous; form usually depressed .....5.
3.—Rufotestaceous, or pale castaneous species.....4.
Brownish, or piceous species.....5.
4.—Thorax nearly square; color bright rufotestaceous, each elytron with a small, darker cloud; surface very shining, punctuation very indistinct.....1. **Heliophyti.**
Thorax very plainly broader than long, dull rufotestaceous; punctuation distinct.....2. **subrufus.**
5.—Thorax without basal marginal line: a faint æneous surface lustre.....6.
Thorax with basal marginal line; without æneous lustre .....7.
6.—Thorax not twice as wide as long; punctuation of elytra vaguely substriate form more oblong.....3. **turbatus.**
Thorax very nearly or fully twice as wide as long; form short, robust; elytral punctuation very much confused.....4. **oregonensis.**
7.—Form robust and convex, rufopiceous or brown; species large.
5. **traductus.**
Form oblong, rather depressed; piceous, umbones paler, species small.
6. **postremus.**
8.—Body above not distinctly punctate, either on thorax or elytra; body beneath concolorous .....7. **repandus.**
Body above distinctly punctate.....9.
9.—Body beneath rufotestaceous .....10.
Body beneath piceous or brown .....11.
10.—Form depressed; surface shining, as if varnished; elytral punctuation fine, smooth at apex.....8. **livens.**
Form moderately convex; surface less shining; elytral punctuation very distinct, even at apex.....9. **vanus.**
11.—Thorax and elytra similar in color.....10. **occidentalis.**
Thorax and head decidedly reddish, elytra yellowish.....11. **bicolor.**
12.—Body more or less fully winged; elytra wider at base than the thorax, umbone distinct.....13.
Body apterous; elytra not wider than the thorax, humeri oblique, umbone wanting; lateral margin visible from above at humerus.....17.

13.—Surface always more or less alutaceous, the thorax always so; form rather elongate; humeri not prominent.....16.

Surface entirely shining; form robust, the humeri well marked and rather prominent; elytral punctuation rather coarse in all the species.....14.

14.—Color rufoferruginous; surface of thorax sparsely, finely and indistinctly punctate.....12. **alternatus.**

Color brownish, or nearly piceous; thorax rather coarsely punctate.....15.

15.—Abdomen of similar color to the upper surface; posterior femora piceous brown and distinctly punctate.....13. **montivagus.**

Abdomen piceous, nearly black; legs entirely piceous.....14. **erro.**

Abdomen paler than the upper surface; posterior femora yellowish and not distinctly punctate.....15. **pygmæus.**

16.—Elytra not shining, the punctuation very indistinct; color yellowish testaceous.....16. **testaceus.**

Elytra shining, punctuation coarse and well marked; color from nearly piceous to dark rufotestaceous.....17. **melanurus.**

17.—Elytra covering the entire abdomen, or at most with merely the tip of the pygidium exposed.....18.

Elytra broadly rotundato-truncate, leaving rather more than the pygidium exposed.....19.

18.—Testaceous, or brownish testaceous, without metallic lustre.

Elytra not very coarsely punctate.

Thorax distinctly punctate, the punctures nearly as coarse as those of the elytra.....18. **rufescens.**

Thorax indistinctly punctate, or nearly smooth: elytral punctures coarser than those of *rufescens*.....19. **insolens.**

Elytra with coarse, deep, close punctures, with an apparent substriate arrangement.

Thorax with scattered, coarse, deep punctures.....20. **perforatus.**

Piceous, with or without metallic lustre; sutural angles rounded.

Surface without metallic lustre; punctures of elytra nearly as coarse at apex as at base; species minute.....21. **solidaginis.**

Surface with distinct metallic lustre; punctures of elytra much less distinct at apex; species larger.....22 **nitidellus.**

19.—Surface shining, slightly metallic; punctuation very sparse and feebly impressed.....23. **mancus.**

1. **L. Heliophyti** n. sp.—Oblong oval, convex, rufotestaceous, shining, each elytron with a fuscous cloud at middle. Antennæ with four basal and three apical joints rufotestaceous, the intermediate joints fuscous. Head smooth, shining. Thorax one-fourth wider than long, not narrowed in front, sides slightly sinuous, obliquely truncate at front angles with distinct post-apical angulation, basal marginal line entire, distinctly impressed at middle, disc convex, smooth. Elytra much wider at base than the thorax, humeri obtusely prominent, umbone moderately prominent, sutural angles distinct, but obtuse, disc convex, sparsely, finely and indistinctly punctate, but absolutely smooth at apex. Body beneath and posterior femora a little darker than above. Abdomen sparsely punctate. Legs pale rufotestaceous. Length .08 inch.; 2 mm.

This species is readily known by its color and bright shining surface, the antennæ being of different colors at base, apex and middle, and by the small fuscous cloud on the middle of each elytron. The humeri is more prominent than in any other species in our fauna.

Feeds on *Heliophytum indicum*, as I am informed by Mr. Schwarz.

Occurs at Selma, Alabama, and Columbus, Texas.

2. **L. subrufus** Lec.—Oblong oval, convex, rufotestaceous, moderately shining. Antennæ pale, outer five joints fuscous. Head smooth, shining. Thorax one-third wider than long, not narrowed in front, sides arcuate, not distinctly oblique at the front angles, basal marginal line extremely fine, disc moderately convex, very sparsely and finely punctate and shining. Elytra wider at base than the thorax, humeri obtusely rounded, umbone moderately prominent, sutural angle obtuse ♂, or rounded ♀, disc convex, the punctures moderate, not closely placed, smoother at sides and apex. Body beneath a little darker than above. Abdomen sparsely punctate. Legs pale rufotestaceous, the posterior femora a little darker. Length .10—.12 inch.; 2.5—3 mm.

This is one of the larger and more conspicuous species in our fauna. It resembles *alternata*, but in addition to the structure of the antennæ, the present species is much more finely punctured.

The male has the last ventral segment sinuate each side, the median lobe moderately prominent and concave. The male is narrower than the female and the thorax less transverse.

Occurs in Kansas, collected in numbers by Prof. F. H. Snow. Lives on *Onosmodium*, Dr. Shimer.

3. **L. turbatus** n. sp.—Oblong oval, not very convex, piceous brown or castaneous, shining, surface with extremely faint bronze lustre. Antennæ with four basal joints pale, outer joints gradually piceous. Head smooth. Thorax nearly one-half wider than long, apparently slightly narrowed in front, sides feebly arcuate, slightly obliquely truncate at anterior angles, base arcuate, marginal line wanting. Elytra wider at base than the thorax, humeri rounded, umbone moderate, sutural angles well defined, disc moderately convex, the punctuation rather coarse and close, smoother at apex, the punctures vaguely in series. Body beneath as dark as above. Abdomen sparsely punctate. Anterior four legs and posterior tibiæ yellowish testaceous, posterior femora brown. Length .10 inch.; 2.5 mm.

This species is more oblong and more coarsely punctate than *oregonensis*. It seems to be mixed in all collections with *melanurus*, but differs from that not only by the structure of the antennæ, but in the absence of the alutaceous surface seen in that species.

Occurs at Galesburg, Ill. (Strumberg), and Detroit, Mich., Selma, Ala., San Antonio, Texas (Schwarz).

4. **L. oregonensis** n. sp.—Oval, slightly oblong, facies robust, convex, castaneous brown, surface with a very faint bronze lustre. Antennæ with four basal joints pale, outer joints fuscous. Head impunctate. Thorax very nearly twice as wide as long, not narrowed in front, sides very feebly arcuate, slightly obliquely truncate at front angles, base arcuate, marginal line not distinct, disc moderately convex, sparsely and very finely punctate, almost smooth at sides and apex. Elytra wider at base than the thorax, humeri broadly obliquely rounded, umbone moderate, sutural angle obtuse, disc convex, the punctures moderately coarse and close near base, finer and sparser at apex and sides. Body beneath darker than above, nearly piceous. Abdomen sparsely punctate. Anterior and middle legs yellowish testaceous, posterior femora castaneous. Length .08—.10 inch.; 2—2.5 mm.

In the male the last ventral is faintly sinuate each side, the median lobe has a small foveiform impression.

This species is not conspicuously marked, except by the very transverse thorax, the slight bronze surface lustre, and very dark underside.

Occurs in Oregon.

5. **L. traductus** n. sp.—Oval, slightly oblong, moderately robust, brown or piceous, moderately shining. Antennæ rufotestaceous, the outer five joints gradually piceous. Head smooth. Thorax rather more than half wider than long, not narrowed in front, sides arcuate, distinctly obliquely truncate at front angles, base arcuate, the marginal line fine, but distinct, disc moderately convex, the punctures fine and rather close near the base, very sparse and indistinct at front and sides. Elytra wider than the thorax at base, humeri rounded, umbone moderately prominent, sutural angle obtuse, disc convex, the punctures moderate in size, not close, gradually finer and smoother at apex and sides, a vague indication of a sutural stria is seen near the apex. Body beneath and posterior femora similar in color to the upper surface. Abdomen rather coarsely and closely punctate at middle. Legs pale rufotestaceous. Length .12—.14 inch.; 3—3.5 mm.

The male has the last ventral segment distinctly sinuate each side, the middle lobe moderately prominent and with a short, but vague longitudinal impression.

This is the largest and most robust species at present known in our fauna.

Occurs in southwestern Virginia; collected by Prof. E. D. Cope (see Trans. Am. Ent. Soc. 1868, p. 125).

6. **L. postremus** n. sp. Elongate oval, rather depressed, piceous, moderately shining, umbones paler. Antennæ pale rufotestaceous, gradually infuscate externally, joints 2–3–4 progressively longer. Head smooth. Thorax one-third wider than long. Apparently narrowed in front, sides feebly arcuate, slightly subangulate at middle, the oblique truncation scarcely evident, disc feebly convex, finely, sparsely punctate, basal marginal line fine, but distinct. Elytra a

little wider at base than the thorax, humeri rounded, umbone not prominent, apical angle distinct, but obtuse, disc not very convex, the punctuation fine, but very distinct, rather close about the scutellum, thence gradually sparser to apex and sides. Body beneath piceous. Abdomen sparsely punctate. Legs uniform rufotestaceous. Length .08 inch.; 2 mm.

This species is readily known in the present series by its very dark color and rather elongate form, resembling in this respect a diminutive *Systena elongata*. In the two specimens before me the umbones are a little paler than the rest of the surface.

Occurs in western Nevada (Morrison).

7. **L. repandus** Lec.—Oblong oval; moderately convex, pale yellowish testaceous, shining. Antennæ slightly darker externally, joints 2–3–4 gradually longer. Head smooth, slightly rufescent. Thorax about one half wider than long, not narrowed in front, sides feebly arcuate, the oblique truncation of the anterior angles scarcely evident, base with extremely fine, but entire marginal line, disc moderately convex, the surface not punctate, but slightly irregular near the base. Elytra wider at base than the thorax, humeri rounded, umbone moderately prominent and smooth, sutural angle distinct, but obtuse, disc feebly convex, the surface rather shining, the punctuation extremely fine, sparse and obsolete, faintly visible near the base only. Body beneath and legs similar in color to the upper surface, the posterior femora very slightly darker and nearly smooth. Abdomen with extremely few, scattered, fine punctures. Length .065—.08 inch.; 1.5—2 mm.

A very inconspicuous species, which, however, could only be confounded with *livens* or *vanus*, both of which have the underside entirely pale, but the surface very distinctly punctate.

Occurs at Los Angeles and San Diego, California.

8. **L. livens** Lec.—Oblong oval, subdepressed, yellowish testaceous, or yellowish white, surface very shining. Antennæ faintly infuscate, the three basal joints pale, joints 2–3–4 progressively longer. Head faintly rufescent, smooth. Thorax about one-third wider than long, not narrowed in front, sides arcuate, the anterior angles feebly obliquely truncate, a basal marginal line very feeble and often indistinct, disc moderately convex, surface sparsely punctate, punctures finer in front. Elytra wider at base than the thorax, humeri rounded, umbone not prominent, sutural angle distinct, but obtuse, disc sparsely, finely punctured at basal half, smooth at apex and sides. Body beneath and posterior femora slightly darker than the upperside. Abdomen distinctly, but sparsely punctate, the first two segments smooth at the sides. Anterior and middle legs and posterior tibiæ pale yellowish testaceous. Length .10 inch.; 2.5 mm.

This species is known by its pale underside and legs, punctate abdomen, very shining and finely punctate surface.

Occurs in California from Los Angeles to Fort Yuma.

9. **L. vanus** n. sp.—Oblong oval, moderately convex, pale yellowish testaceous, shining, the suture very narrowly infuscate behind the middle. Antennæ pale, the outer five joints slightly darker. Head decidedly darker than the thorax, smooth. Thorax about one-third wider than long, not narrowed in front, sides very distinctly arcuate, at anterior angles obliquely truncate, basal marginal line entirely wanting, disc moderately convex, surface slightly wrinkled, the punctures relatively coarse, but not close. Elytra distinctly wider at base than the thorax, humeri rounded, umbone moderate, sutural angle distinct, but obtuse, disc moderately convex, the punctures moderate, rather closely placed, a little finer at apex, but distinctly impressed throughout. Body beneath and legs similar in color to the upper surface. Abdomen very indistinctly punctate. Length .08 inch.; 2 mm.

This species is the most distinctly punctate of the present series of pale species, and while a little variable in degree, it is never so finely punctate as in *livens* or *repandus*.

Occurs in western Texas and at Seligman, Ariz. (Wickham).

10. **L. occidentalis** n. sp.—Oblong oval, feebly convex, yellowish testaceous, moderately shining. Antennæ pale at basal half, darker externally. Head slightly rufescent, smooth, shining. Thorax one-half wider than long, apparently slightly narrowed in front, broadest a little behind the middle, sides arcuate, slightly obliquely truncate at front angles, hind angles very broadly rounded, base truncate at middle and with an extremely indistinct marginal line, disc moderately convex, the surface very distinctly and moderately closely punctate at base, sparser and fine in front. Elytra distinctly wider at base than the thorax, humeri rounded, umbone not prominent, sutural angle obtusely rounded, disc moderately convex, the punctuation fine and sparse, nearly smooth at apex. Body beneath and posterior femora brownish testaceous, abdomen sometimes piceous, the legs otherwise pale yellowish testaceous. Abdomen very distinctly, but not closely punctate. Length .08—.10 inch.; 2—2.5 mm.

Resembles *repandus*, but very distinctly punctate, and with the underside darker, in fully mature specimens nearly black.

This species has been heretofore considered and determined for several correspondents as *nigripalpis* Lec., but an examination of the type of the latter shows it to be at least congeneric with (Malacosoma) fuscula *Lec.* (Lyperaltica *Crotch*) and probably not specifically different.

Occurs in Colorado, Utah and Arizona.

11. **L. bicolor** n. sp.—Oblong oval, moderately convex, beneath piceous, head and thorax rufotestaceous, elytra and legs yellowish testaceous, surface moderately shining. Antennæ pale, slightly darker externally. Head rufotestaceous, smooth. Thorax one-third wider than long, not narrowed in front, sides arcuate, distinctly obliquely truncate in front, base truncate at middle, with distinct marginal line, disc convex, sparsely, but distinctly punctate. Elytra distinctly wider at base than the thorax, humeri rounded, umbone moderate,

sutural angle obtusely rounded, disc moderately convex, the punctuation distinct, moderately close at base and coarser than that of the thorax, finer at apex. Abdomen very distinctly punctate. Anterior and middle legs pale yellowish testaceous, the punctuation slightly darker. Length .08 inch.; 2 mm.

In the male the last ventral segment is sinuate each side, the middle produced in a slight lobe, which has a triangular impression which extends to the base of the segment.

The color at first sight will readily distinguish this species. The thorax is more nearly square than in the others of this series.

Occurs in New Mexico.

12. **L. alternata** Ziegl.—Oblong oval, moderately convex, rufocastaneous, shining. Antennæ three-fourths the length of the body, piceous, four basal joints pale, joints 2–3 4 equal in length. Head smooth, impunctate. Thorax one-third wider than long, apparently slightly narrowed in front, sides arcuate, the oblique truncation scarcely evident, disc convex, nearly smooth, a few sparsely placed, fine punctures along the base. Elytra wider at base than the thorax, humeri rounded, umbone feeble, form regularly oval, sutural angle rounded, disc convex, the punctuation moderate, not deep nor closely placed, very confused, finer near the sides. Body beneath similar in color to the upper surface. Abdomen smooth, sparsely punctate. Legs rufotestaceous, the anterior and middle paler. Length .10 inch.; 2.5 mm.

This is the largest species in the series with the joints 2–3–4 of the antennæ of equal length, and has the thorax much less punctate than in any other. The suture is sometimes narrowly infuscate.

I have examined the types of Ziegler, Melsheimer and LeConte, and find *alternata* (Psylliodes), *rubicunda* (Aphthona) and *rubidus* identical. The types of the latter are in bad state.

Occurs in Pennsylvania, near Denver, Colorado, and at Fort Laramie (LeConte).

13. **L. montivagus** n. sp.—Oval, convex, moderately robust, brownish, shining. Antennæ slender, rufotestaceous at base, the outer five joints piceous, joints 2–3–4 equal in length. Head shining, impunctate. Thorax one-fourth wider than long, not narrowed in front, sides feebly arcuate, anterior angles indistinctly obliquely truncate, disc convex, shining, not alutaceous, the punctuation coarse and close, but not deep, finer toward the sides and nearly as coarse as that of the elytra. Elytra distinctly wider at base than the thorax, humeri obtusely rounded, umbone moderately distinct, form regularly oval, widest at middle, sutural angle distinct, very little obtuse, disc convex, shining, punctuation moderately coarse, close and deep, finer toward apex, confused. Body beneath as dark, or darker than above. Abdomen coarsely, sparsely punctate. Anterior and middle legs rufotestaceous, posterior femora piceous, alutaceous and distinctly punctate, tibiæ paler. Length .07—.08 inch.; 2 mm.

This species resembles *melanurus*, but is more robust, the humeri more distinct, and the surface not alutaceous. It is larger and more elongate than *pygmæus*, and with the elytral punctuation confused.

Occurs in California, in the Calaveras region, also in western Nevada.

14. **L. erro** n. sp.—Oval, convex, facies robust, piceous, shining. Antennæ piceous, nearly black. Head shining, impunctate. Thorax one-half wider than long, not narrowed in front, sides nearly straight, anterior angles obliquely truncate, disc convex, the punctuation fine and sparse, the apical region and a rather broad median space impunctate. Elytra wider at base than the thorax, humeri obliquely rounded, umbone moderately prominent, sutural angles well defined, disc convex, the punctuation rather coarse and close, but finer and sparser toward apex and sides. Body beneath entirely black. Abdomen sparsely punctate. Legs entirely piceous. Length .07 inch.; 2 mm. nearly.

This species is nearly related to *montivagus*, but is more shortly oval. It differs notably from every species in our fauna by the very dark legs.

Occurs at White Fish Point, Lake Superior region (Schwarz).

15. **L. pygmæus** n. sp.—Oval, robust, convex, piceous, shining. Antennæ slender, brown, three basal joints paler. Head impunctate, feebly shining. Thorax one-half wider than long, not narrowed in front, sides feebly arcuate, vaguely subangulate at middle, anterior angles obliquely truncate, disc moderately convex and shining, the punctuation moderately coarse and deep, closely placed at base, sparser in front. Elytra very obviously wider at base than the thorax, humeri obtuse, umbone moderately prominent, form regularly oval, widest at middle, scarcely more than a fourth longer than wide, sutural angle well defined, disc convex, punctuation coarse, deep and closely placed, substriately arranged at base, less deep at apex. Body beneath paler than above. Abdomen very indistinctly punctate. Legs entirely yellowish testaceous, the posterior femora not distinctly punctate. Length .06 inch.; 1.5 mm.

The sides of the elytra at and near the apex are paler in color than the disc, the epipleuræ also paler. The posterior femora are much darker on the upperside than on the lower. The characters given in the table will enable this small species to be known.

Occurs in Georgia (Morrison).

16. **L. testaceus** Mels.—Oblong oval, moderately convex, yellowish testaceous, head slightly darker, surface finely alutaceous and with a greasy aspect. Antennæ slender, yellowish testaceous, joints 2-3-4 equal in length. Head impunctate. Thorax one-third wider than long, not narrowed in front, sides irregularly arcuate, the anterior angles slightly obliquely truncate, disc moderately convex, very distinctly alutaceous, the punctuation sparse, rather fine and indistinct. Elytra very little wider at base than the thorax, humeri rounded, umbone distinct, but not prominent, form regularly oval, widest at middle, sutural

angle obtusely rounded, disc moderately convex, surface distinctly alutaceous, punctuation sparse, fine and obsolete. Body beneath a little darker than above. Abdomen shining, sparsely indistinctly punctate. Legs yellowish testaceous, posterior femora sparsely obsoletely punctate. Length .07–.08 inch.; 2 mm.

This species makes the nearest approach in form to the apterous forms by the rather narrow elytral base and rounded humeri, but the umbone is quite distinct and the body winged. The base of the thorax is without marginal line. The distinctive characters of this species are in form of the antennæ, the color and the character of the surface and punctuation.

Occurs from Pennsylvania to Georgia.

17. **L. melanurus** Mels.—Oblong oval, moderately convex, brownish, moderately shining. Antennæ slender, rufotestaceous, outer five joints darker. Head minutely alutaceous, impunctate. Thorax slightly wider than long, not narrowed in front, sides feebly arcuate with a slight angulation at middle, apical angles obliquely truncate, with distinct post apical angulation, disc moderately convex, very distinctly alutaceous and slightly wrinkled near base, punctuation moderately coarse, but very indistinct, especially near apex. Elytra a little wider at base than thorax, humeri rounded, umbone distinct, form regularly oval, widest at middle, sutural angle obtusely rounded, disc convex, very faintly alutaceous, the punctuation coarse, deep and close, less so at apex. Body beneath similar in color to the upper surface. Abdomen shining, sparsely, indistinctly punctate. Anterior and middle legs yellowish testaceous, posterior femora brown, sparsely, indistinctly punctate, posterior tibiæ rufotestaceous. Length .08 inch.; 2 mm.

In this species the thorax is probably more rugulose than in any other of our fauna. It has the coarsest elytral punctuation of all those with the joints 2–3–4 of antennæ equal.

Occurs from Canada and Dakota to North Carolina, Kansas, Illinois and Missouri.

18. **L. rufescens** n. sp.—Oblong oval, rufotestaceous, moderately shining. Antennæ longer than half the body, pale rufotestaceous, slightly darker externally, joints 2–3–4 equal in length. Head smooth, a distinct fovea near the top of each eye. Thorax one-half wider than long, not narrowed in front, base moderately arcuate, without marginal line, sides nearly straight, anterior angles feebly obliquely truncate, disc convex, the punctures moderate, sparsely placed, smaller at apex. Elytra not wider at base than the thorax, form regularly oval, humeri oblique, umbone wanting, sutural angles distinct, but obtuse, pygidium concealed, disc convex, the punctuation moderately coarse, not close, finer and sparser at apex and sides. Body beneath a little darker than above. Abdomen very indistinctly punctate. Legs pale rufotestaceous. Length .05 inch.; 1.25 mm.

Also a small species, entirely apterous, and distinguished from those at present known in this series by the pale color. The apices

of the elytra are not rounded, the sutural angle quite distinct, and the pygidium covered.

Occurs in Mendocino County, California.

19. **L. insolens** n. sp.—Oblong oval, pale rufotestaceous, moderately convex and shining. Antennæ longer than half the body, pale rufotestaceous, joints 2–3–4 equal in length. Head smooth, a few coarse punctures near each eye. Thorax one-third wider than long, not narrowed in front, sides obliquely truncate in front, then feebly arcuate, base arcuate, without marginal line; disc moderately convex, sparsely, finely and indistinctly punctate. Elytra not wider at base than the thorax, oval, humeri and umbone indistinct, sutural angle obtuse, disc moderately coarsely, not closely punctate, punctures very little finer to apex. Body beneath and legs colored as above. Abdomen coarsely punctate. Length .08 inch.; 2 mm.

This species is considerably larger than either of those with which it is associated. It resembles some of the paler forms of *melanurus*, and also *alternatus*, but is readily known by the rounded humeri and absent umbones.

Occurs in Virginia and New Jersey.

20. **L. perforatus** n. sp.—Elongate oval, very convex, rufotestaceous, shining. Antennæ with four basal joints pale, the outer brown. Head smooth, shining. Thorax one-third wider than long, not narrowed in front, sides straight, anterior angles obliquely truncate, base broadly arcuate, disc convex, slightly alutaceous, the punctuation rather coarse, but indistinct and sparse. Elytra not wider at base than the thorax, form regularly oval, umbones not evident, sutural angle well defined, pygidium entirely concealed, disc convex, the punctuation relatively very coarse, deep and rather close, well marked at sides and apex. Body beneath concolorous. Abdomen indistinctly punctate. Legs pale yellowish. Length .05 inch.; 1.25 mm.

This minute species may be known in the apterous series by its color and the coarse elytral punctuation. The elytra meet fairly at apex and conceal the pygidium completely.

Occurs at Tampa, Florida (Schwarz).

21. **L. solidaginis** n. sp.—Oblong oval, convex, piceous black, without metallic lustre. Antennæ longer than half the body, rufotestaceous, slightly darker at tip, joints 2–3–4 equal in length. Head smooth, impunctate. Thorax one-fourth wider than long, not narrowed in front, base moderately arcuate, hind angles distinct, but obtuse, sides nearly straight, anterior angles obliquely truncate, with slight post-apical angulation, disc convex, without basal marginal line, surface not very shining, punctuation moderate, not closely, but very regularly placed. Elytra not wider at base than the thorax, humeri oblique, umbone wanting, form regularly oval, gradually narrowed at apical third, the apices separately rounded, leaving the tip of the pygidium exposed, disc convex, moderately, coarsely, deeply and closely punctate, not smoother at apex. Body beneath piceous. Abdomen indistinctly punctate. Legs rufotestaceous, the posterior femora brown. Length .04—.05 inch.; 1—1.25 mm.

This species may be readily known by its small size, almost true black color and very coarsely punctate elytra, the entire surface without metallic lustre.

Occurs in Sumter Co., Fla., on a species of *Solidago* (Schwarz).

22. **L. nitidellus** Cockerell.—Oblong oval, convex, piceous, surface distinctly bronzed, shining. Antennæ longer than half the body, slender, rufotestaceous at base, piceous externally. Head impunctate. Thorax a little wider than long, not narrowed in front, base broadly arcuate, hind angles rounded, sides feebly arcuate, anterior angles obliquely truncate, with distinct post-apical angulation, disc convex, distinctly alutaceous, the punctures moderate, neither deep nor closely placed, finer in front. Elytra not wider at base than the thorax, humeri oblique, umbone wanting, form regularly oval, broadest at middle, apices separately rounded, tip of pygidium exposed, disc convex, the punctuation rather coarse and close at base, gradually finer toward apex and sides. Body beneath piceous, less shining. Abdomen alutaceous, rugose, the punctures coarse and close, but shallow. Legs rufotestaceous, the posterior femora much darker. Length .08 inch.; 2 mm.

In the male the last ventral segment is truncate at apex and with a small, smooth tubercle at middle of disc

As the bronze surface is not a common character among our species there need be no difficulty in distinguishing this by its apterous form, obliterated humeri and rounded tips of elytra.

This species was rather imperfectly described by Mr. Cockerell in a little sheet which may not fall in the hands of many students. Through his kindness I possess the specimen described, and am able to fix its specific relationships with greater certainty.

Occurs in Arizona, New Mexico and Colorado.

23. **L. mancus** Lec.—Oblong oval, convex, piceous, surface distinctly bronzed and shining. Antennæ longer than half the body, piceous, the outer six joints distinctly stouter, joints 2–3–4 equal in length. Thorax very little wider than long, not narrowed in front, base broadly arcuate, hind angles very obtuse, sides feebly arcuate, front angles slightly obliquely truncate, disc moderately convex, punctuation sparse and indistinct, at apex smoother, base without marginal line. Elytra not wider than the thorax, humeri entirely obliterated, no umbone, sides arcuate, gradually wider posteriorly, obliquely truncate at apex, leaving the entire pygidium exposed, disc convex, sparsely, finely and indistinctly punctate. Body beneath piceous, shining Abdomen sparsely, indistinctly punctate. Legs piceous, posterior femora bronzed, the tibiæ pale brown or testaceous. Length .06 inch.; 1.5 mm.

This species, which is one of the smallest in our fauna, is readily known by the truncate elytra, bronzed and nearly smooth surface. The general appearance is that of a minute *Meloe*. The body is entirely apterous and the metasternum quite short.

Occurs in California.

The following species has been described by Motschulsky:

Teinodactyla californica Motsch.—Oblonga, testacea, punctatissima, corpore subtus capiteque piceis; femoribus rufopiceis. Long. 1 lin.; lat. .5 lin.

This Teinodactyla resembles greatly our species of Europe, such as *atricilla* and *melanocephala*, but it is considerably more elongate and more strongly punctate on the elytra.

Occurs in California.

In the preliminary remarks to the paper in which this is described Motschulsky mentions that part of the species were purchased from Dupont as collected in California. On several occasions I have had to deal with this material and have satisfied myself from the identification of nearly all the species that the series was collected in southwestern Texas.

There is very little doubt in my mind that the above species came from that region, and that it is possibly indentical with *occidentalis* Horn.

Longitarsus nigripalpis Lec. must be placed with *Malacosoma fusculum* Lec., from which it may not differ specifically.

GLYPTINA Lec.

Head inserted as far as the eyes, front not carinate, the tubercles distinct, clypeus broadly emarginate, labrum arcuate in front. Maxillary palpi moderate in length, second joint rather slender, conical, third much shorter and stouter, fourth more slender, conical and acute at tip. Antennæ as long as half the body, slender, very slightly thicker externally; first joint cylindrical, second more than half the length of first, conical, joints 3–7 gradually increasing in length, 8–10 shorter, eleventh longer and acute at tip. Thorax broader than long, usually narrowed in front, sides and base arcuate, apex truncate, anterior angles slightly obliquely truncate, the hind angles obtuse, disc without basal or transverse impression. Elytra oval, striato-punctate at base and sides confused at apex, often smooth at sides and apex. Prosternum moderate between the coxæ, slightly dilated at apex, the cavities rather widely open behind. Ventral segments all free, the first as long as the next two. Legs moderately long. Posterior tibiæ straight, terminated at middle of its tip by a moderate spur, the outer edge grooved near the tip. Tarsi moderately long, the first joint of the posterior one-third the length of the tibia and equal to the other joints together. Claws simple.

Through the kindness of Mr. Jacoby I have been enabled to study a specimen of *Batophila rubi*, and have been forced to the conclusion that Batophila and Glyptina cannot be retained as distinct, as there does not seem to be any structural difference.

All the European species are said to be apterous, this is the case also with *bicolor*, which in turn resembles Podagrica in its color. Following this *cyanipennis* has similar colors, and while the body is feebly winged, the elytra are united. The pale species which follow on have better marked humeri and well developed wings, but this is not an abrupt transition as *spuria* has but feeble humeri.

The elytral striæ are confused at apex and sides in *bicolor*, while in the three following species the striæ are entire and regular, while in the last two species the sides and apex are quite smooth.

It seems to me that Crotch was correct when he united Glyptina and Batophila, but he seems to have overlooked the fact that Glyptina has the right to priority.

The species may be readily distinguished by the following table:

Elytra blue, with metallic lustre.
  Head and thorax reddish yellow; humeri indistinct.
    Thorax somewhat wrinkled, vaguely punctate; elytral striæ much confused at apex.....**bicolor.**
    Thorax smooth, very sparsely, finely punctate; striæ entire, not confused. **cyanipennis.**
  Head and thorax shining black; humeri distinct.....**nivalis.**
Elytra yellowish or rufotestaceous; humeri wider than thorax.
  Elytral striæ of well defined punctures, the lateral striæ distinct.
    Lateral striæ, especially the ninth, deeper than those of the disc; body beneath brown.....**brunnea.**
    Lateral striæ faint; body beneath brownish piceous, very rarely pale. **spuria.**
  Elytral striæ of very fine or obsolete punctures, sides and apex smooth.
    Elytral striæ of extremely fine punctures; body beneath always pale. **cerina.**
    Elytral striæ of coarse, obsolete punctures near the base and scutellum only; body beneath piceous or nearly black.....**atriventris.**

G. bicolor n. sp.—Oblong oval, more narrowed in front, convex, beneath piceous; head, thorax and legs pale reddish brown, elytra bright bluish green, metallic. Antennæ with basal joint brown, next three rufotestaceous, outer joints piceous. Head impunctate. Thorax one-third wider than long, narrower at apex, sides arcuate, anterior angles slightly obliquely truncate, disc convex, the surface somewhat wrinkled, the punctuation very indistinct and rather fine. Elytra not wider at base than the thorax and very nearly continuous in outline, surface shining, confusedly punctate at apex, striato-punctate at base and sides.

the punctures coarse, deep and moderately close, intervals flat, with smaller punctures than those of the striæ. Prosternum and side pieces smooth. Abdomen shining, sparsely, indistinctly punctate, and with few hairs. Length .10—.14 inch.; 2.5—3.5 mm.

In the specimens before me no sexual differences have been observed.

The facies of this species is that of a large Chætocnema, and its colors are so exactly those of many Podagrica that the species was referred to that genus in the "Classification" (1883, p. 353). Notwithstanding its resemblance to the latter genus, there can be no doubt of its correct reference to Glyptina, more especially in view of the structure of the front coxal cavities.

Occurs in Georgia (Morrison), Louisiana and Kansas.

G. cyanipennis Crotch.—Oblong oval, convex, body beneath piceous; head, thorax and legs reddish yellow, elytra metallic blue. Antennæ rufotestaceous, a little darker at tip. Head impunctate. Thorax about one-third wider than long, slightly narrowed in front, sides arcuate, the anterior angles obliquely truncate with a slight post-apical angulation, disc convex, smooth and shining, with a few fine scattered punctures. Elytra scarcely wider at base than the thorax, humeri obliquely rounded, umbone feeble, disc striate, striæ coarsely, serrately punctured, the punctures finer near the apex, intervals slightly convex, a little wider than the striæ, each with a single row of finer punctures. Abdomen piceous, shining, sparsely, finely punctate. Length .08 inch.; 2 mm.

This species has very nearly the form and elytral sculpture of *rubi* of Europe, but is a little less convex. It forms a link between the species of Europe and those which follow. The body is not entirely apterous, but the elytra seem to be connate. All the European species are said to be apterous, as is the *bicolor* which precedes.

Occurs at Biscayne Bay, Florida, and in Texas.

G. nivalis n. sp.—Oblong oval, moderately convex and shining, body beneath, head and thorax piceous black, elytra metallic blue. Antennæ piceous, four basal joints rufotestaceous. Head smooth. Thorax one-half wider than long, not narrowed in front, sides slightly arcuate, anterior angles slightly obliquely truncate, the posterior a little prominent, disc moderately convex, sparsely finely punctate. Elytra wider at base than the thorax, humeri distinct, umbone moderate, smooth, disc regularly striato punctate, striæ not impressed, punctures rather fine, moderately close, intervals flat, indistinctly, sparsely punctate, punctures less distinct at sides and apex. Body beneath shining, abdomen sparsely punctate. Anterior and middle femora brown, posterior piceous, slightly bronzed, tibiæ and tarsi testaceous. Length .09 inch.; 2.5 mm.

This species recedes from the others with metallic blue elytra in having the humeri quite distinct. In this respect it resembles *cerina*, although the elytral sculpture is very like *spuria*.

One specimen collected by Prof. Snow near Hot Springs, Las Vegas, New Mexico, at an elevation of seven thousand feet.

G. brunnea n. sp.—Oblong oval, rather robust, moderately convex, shining, reddish brown above and beneath, legs and antennæ pale rufotestaceous. Head smooth, impunctate. Thorax nearly twice as wide as long, slightly narrowed in front, anterior angles obliquely truncate, with slight post-apical angulation, sides feebly arcuate, disc convex, shining, the punctures extremely fine and sparse. Elytra very distinctly wider than the thorax, humeri obtuse, umbone moderately prominent, disc striato-punctate, the punctures moderately coarse and closely placed, but not serrate, the ninth stria more distinctly impressed than the discal, intervals flat, wider than the striæ, uniseriately finely punctate. Body beneath a little darker than above. Abdomen slightly rugulose and punctate, the last two segments more closely. Length .07—.08 inch.; 1.75—2 mm.

This species is the most robust of those of non-metallic color, resembling some of our Longitarsus. The reddish brown color is peculiar to it. It differs from *cerina*, to which it is more especially allied by its comparatively smooth thorax, shorter and more robust form and by the underside not of different color from the upper, although slightly darker.

Occurs in Georgia, Louisiana, Texas and Wisconsin (Chope).

G. spuria Lec.—Oblong oval, moderately convex, body beneath piceous, above rufotestaceous. Antennæ entirely rufotestaceous. Head smooth, impunctate. Thorax one-half wider than long, not narrower in front, except at the oblique truncation, behind which is a distinct angulation, sides arcuate, disc convex, the punctuation relatively coarse and sparse, but somewhat variable. Elytra distinctly wider at base than thorax, humeri broadly rounded, disc faintly striate, striæ coarsely and closely punctate, the lateral striæ less deep, intervals wider than the striæ, slightly convex, uniseriately finely punctate. Abdomen piceous, shining, scarcely visibly punctate. Legs pale yellowish testaceous. Length .06—.07 inch.; 1.5—1.75 mm.

The punctuation of the thorax varies from relatively coarse to almost smooth. One specimen before me which I suppose to be a male, has the last ventral segment pale and more convex than the others. Rarely the abdomen may be entirely pale.

From the fact that the striæ are distinct at the sides as well as on the disc this species is more nearly related to the preceding than any other, but may be known by its less robust form and piceous underside.

Occurs from Pennsylvania to Florida, and westward to Kansas, Colorado and Dakota.

G. cerina Lec.—Oblong oval, feebly convex, entire body and members pale yellowish testaceous, the head slightly darker. Head smooth, impunctate. Thorax a little more than half wider than long, not distinctly narrowed in front, sides feebly arcuate, obliquely truncate at front angles, without distinct post-apical angulation, disc moderately convex, sparsely punctate or quite smooth. Elytra distinctly wider at base than the thorax, humeri rounded, umbone scarcely prominent, disc indistinctly striato-punctate, the punctures fine, feebly impressed and not close, the sides and apex quite smooth. Abdomen sparsely, indistinctly punctate. Length .08—.09 inch.; 2—2.25 mm.

By the table which precedes, it will be observed that two species have the sides of the elytra quite smooth, this and *atriventris*. In the latter the underside is normally piceous, in marked contrast with the upper surface. In *cerina* the elytral punctures, although fine, are well defined and distinct, and not vague as in the other.

Occurs in California and Arizona.

G. atriventris n. sp.—Oblong oval, feebly convex, body beneath piceous, above pale yellowish testaceous. Antennæ slightly darker externally. Head smooth, impunctate. Thorax a little more than half wider than long, very little narrowed in front, anterior angles obliquely truncate, without post-apical angulation, sides slightly arcuate, disc sparsely, finely punctate or quite smooth. Elytra distinctly wider at base than the thorax, humeri obtusely rounded, umbone distinct, disc indistinctly striato-punctate, the punctures relatively large, but very vague and indistinct, intervals wider and with an indistinct series of finer punctures, sides and apex quite smooth. Abdomen slightly rugose and indistinctly punctate. Legs pale yellowish testaceous. Length .06—.08 inch.; 1.5—2 mm.

This species varies in the punctuation of the thorax as in *cerina*, although the punctures are never so distinct as in that species. The punctures of the striæ are larger than in *cerina*, but more vague. Occasionally specimens are seen with a brown abdomen which might be confounded with *cerina*, in which, however, the underside is quite pale.

Occurs in Colorado, New Mexico, Texas, Arizona and California.

PHYLLOTRETA Foudras.

Head small, deeply inserted in the thorax, the eyes convex and prominent, front distinctly carinate between the antennæ, the tubercles obliterated. Last joint of maxillary palpi nearly as long as the preceding, elongate conical. Antennæ half as long as the body or slightly longer, slender in some species, or gradually thicker in others, in many species different in the sexes in the form of the middle joints. Prothorax always broader than long and somewhat narrowed

in front, apex not emarginate, base slightly arcuate; prosternum narrowly separating the coxæ, slightly dilated behind them, the coxal cavities open behind, angulate externally exposing the trochantin. Elytra oval, usually convex, the humeri never prominent. Legs moderately long, the posterior thighs stout, posterior tibiæ gradually broader to tip, not sulcate on the outer edge, although slightly excavate near the tip. Tarsi of hind legs shorter than the tibia, the first joint about one-third the length of the tibia and equal to the other three; claws simple.

These insects are all of rather small size, many of them marked with a yellowish white sinuous vitta on the elytra. The European species are said to depredate on various species of Cruciferæ; the same is known of several of our species, but Prof. Riley states that the larva of *P. vittata* "feeds upon the roots below the ground (Third Missouri Rep. p. 83)," the habit of those in Europe being to mine the leaves.

Our species, as well as those of Europe, may be arranged in two parallel series. In the first, the fourth joint of the male antennæ is often thickened, the fifth always so, and at the same time elongate. In the female the fifth joint is always longer than the fourth or sixth. In the second series the antennæ are alike in the sexes, the joints 2–10 not varying greatly in length.

In the vast majority of our species the antennæ are gradually thicker to tip, but in *pusilla*, *Lewisii* and *cucicollis*, the antennæ are slender, as in Systena.

The body is usually moderately convex, but several are quite depressed,—*albionica* and *pusilla*.

The males have the last ventral more or less impressed at tip, usually triangularly, but both the males and females of the first series may be known from those of the second by the fifth joint of the antennæ being longer than either of the adjacent joints.

For this genus Crotch adopted the name *Orchestris* Kby., but the reasons why it should not be followed have already been given by Dr. LeConte (Proc. Am. Philos. Soc. 1878, p. 615).

Phyllotreta may be divided into two series in the following manner:

Intermediate joints of male antennæ thickened and elongate, the fifth joint always, sometimes also the fourth; in the female the fifth joint is always longer than either the fourth or sixth. ..... SERIES A.

Antennæ not different in the sexes, the joints gradually slightly stouter from the second to the tip, the fifth joint never longer than the sixth. SERIES B.

Series A.

Fifth joint of ♂ antennæ notably enlarged and thickened; species of rather robust facies: elytra vittate, except in *denticornis* and *Ulkei*.....2.

Fifth joint of ♂ antennæ merely slightly longer and stouter; species of elongate, depressed form, without vitta, at most an indistinct posterior spot.

Head not distinctly punctate; surface with scarcely any bronze lustre; punctuation of thorax not close; elytra with faint spot posteriorly.

8. **decipiens.**

Head closely punctate; surface with very evident bronze lustre; punctuation of thorax close; elytra always without spot.....9. **albionica**

2.—Elytra not vittate.

Sixth joint of ♂ antenna prolonged beneath in a spine-like process.

6. **denticornis.**

Sixth joint of ♂ antenna as long as the fourth and cylindrical.

7. **Ulkei.**

Elytra vittate; sixth joint ♂ simple.....3.

3.—Elytra with a simple vitta as in *Systena*.....1. **lepidula.**

Elytral vitta more or less dilated or appendiculate at either end and sinuous.....4.

4.—Lower angle of fifth antennal joint ♂ distinctly prolonged; elytral vitta very broad .....5. **robusta.**

Lower angle of fifth joint not prolonged.....5.

5.—Elytral vitta at middle as broad as the space between it and the suture; incurved at base.....4. **oregonensis.**

Elytral vitta narrow .....6.

6.—Vitta incurved at base, approaching the scutellum.....3. **vittata.**

Vitta parallel, with suture at its basal half.....2. **sinuata.**

Series B.

Elytra with vitta or spots, form more robust.....2.

Elytra unicolorous.

Head and thorax bright reddish yellow, elytra bluish green metallic.

16. **picta.**

Head and thorax not very unlike the elytra in color ..... 3.

2.—Each elytron with two oval yellow spots, one humeral, the other subapical.

11. **bipustulata.**

Elytra with a sinuous vitta, appendiculate at each extremity 10. **ramosa.**

3.—Form very depressed and slender, surface with æneous lustre, elytral punctuation equal.....15. **pusilla.**

Form more robust and convex, surface of elytra decidedly blue.....4.

4.—Punctuation of elytra equal and uniform .....14. **Lewisii.**

Punctuation unequal, the coarser punctures forming striæ near base.....5.

5.—Thorax æneous; hind tibiæ slender.....13. **æneicollis.**

Thorax and elytra blue; hind tibiæ stouter than usual.

12. **chalybeipennis.**

1. **P. lepidula** Lec.—Oblong oval, moderately convex, piceous, shining, surface with faint æneous lustre, each elytron with a narrow, simple, yellow

vitta, nearly straight, incurved at apex. Antennæ scarcely half as long as the body, piceous, joints 1–4 usually paler. Head rather coarsely and closely punctate. Thorax not quite twice as wide at base as long, sides arcuately narrowing to the front, disc convex, coarsely and moderately closely punctate, the surface faintly alutaceous. Elytra slightly wider at base than the thorax, surface more finely and sparsely punctate than the thorax, smoother at apex, the yellow vitta nearly exactly median, rather narrow, of equal width throughout, slightly incurved at apex. Body beneath piceous, with a faint æneous surface, abdomen sparsely, finely punctate. Legs similar in color, the tibiæ paler at base. Length .08—.10 inch.; 2—2.5 mm. Plate VI, fig. 17.

Male.—Last ventral segment notched each side of the median lobe and with an impressed median line extending the entire length of the segment. The antennæ have joints 2–3–4 nearly equal in length, the fourth very slightly broader, fifth much broader and equal to the two preceding, sixth small, nodiform, 7–10 equal in length, but gradually broader, eleventh longer.

Female.—Last ventral simple. Antennæ with the fifth joint longer than the fourth or sixth, but not stouter, 6–10 equal in length, eleventh longer.

Among the species with vittate elytra this may be at once known by the form of the vitta, approaching more closely to *Systena* than any other species.

Occurs in California.

2. **P. sinuata** Steph.—Elongate oval, moderately robust, piceous, shining, æneous lustre very faint, each elytron with a narrow sinuous vitta, parallel with the suture at base. Antennæ nearly half as long as the body, piceous, the three or four basal joints paler. Head sparsely, finely punctulate. Thorax nearly twice as wide at base as long, sides rather strongly arcuate and distinctly narrowed in front, disc convex, surface very finely alutaceous, the punctures not coarse, more widely placed than their own diameters. Elytra scarcely wider than the thorax, humeri obliquely rounded, disc convex, the punctures coarser and closer than those of the thorax, finer near the apex, without tendency to strial arrangement; vitta narrow, parallel with the suture at basal half, not incurved at base, a short, broad, post-humeral branch, apical third strongly sinuous. Body beneath piceous, abdomen sparsely punctate. Legs piceous, tarsi brown. Length .10 inch.; 2.5 mm. Plate VI, fig. 15.

Male.—Last ventral slightly sinuous each side, a broad triangular impression at apex. Antennæ with joints 2–3–4 nearly equal in length, the fourth much broader, fifth longer than the preceding two and much dilated, sixth short, oval, narrow at base, 7–10 equal in length, eleventh longer.

Female.—Last ventral simple. Antennæ as in *vittata*.

This species, which seems widely spread in Europe, has been introduced and become widely spread in our Atlantic region, as far west as Missouri. It is rather remarkable that Crotch should have failed to recognize a common English species when he described *Zimmermanni*.

Occurs from the New England States to Georgia and westward to Missouri.

3. **P. vittata** Fab.—Elongate oval, moderately convex, piceous, shining, surface with slight æneous lustre, elytra with a yellow vitta incurved at base, thickened and slightly incurved at apex. Antennæ half as long as the body, piceous, the basal two or three joints testaceous. Head sparsely, finely punctate. Thorax about one-third wider than long, narrowed in front, sides moderately arcuate, convex, surface minutely alutaceous, punctures moderately coarse and close, denser at the sides. Elytra scarcely wider at base than the thorax, humeri obliquely rounded, convex, punctures coarser than those of the thorax, moderately closely placed, finer near the apex and with a tendency to a strial arrangement in the yellow vitta; the vitta is narrow at middle, incurved at base and with a broad, short, post-humeral branch, the apical third is abruptly broader, slightly incurved at tip. Body beneath piceous, abdomen faintly alutaceous, punctures numerous, but not coarse. Legs piceous, the tibiæ and tarsi brown. Length .08 inch.; 2 mm. Plate VI, fig. 14.

Male.—Last ventral not distinctly lobed, at middle slightly flattened and with a vague longitudinal impression extending two-thirds to base. Antennal joints 2–3–4 nearly equal in length, the fourth broader, fifth a little broader and nearly equal in length to 3 and 4, sixth elongate oval, 7–10 equal in length, eleventh longer.

Female.—Last ventral simple. Fifth joint of antennæ longer than fourth or sixth, sixth shorter than seventh, joints 7–11 as in the male.

This is one of our best known species of the Atlantic region, and is closely related to *sinuata* and *oregonensis*, differing from the former more especially by the antennal characters of the male, as well as by the incurved base of the vitta. From the second it differs in smaller size, narrower thorax and much narrower vitta and less robust form.

Specimens often occur with the intermediate portion of the vitta wanting, so that markings resemble somewhat *bipustulata*, but the two are readily known by the antennal characters. Occasionally specimens are seen with the front and middle legs entirely pale, also the hind tibiæ and tarsi. The vitta may be prolonged to the apex.

Occurs in the entire Atlantic region.

4. **P. oregonensis** Crotch.—Oblong oval, moderately robust, piceous, shining, surface scarcely æneous, elytra with a broad, sinuous vitta, somewhat incurved at base, strongly so at apex. Antennæ nearly half as long as the body, piceous, three or four basal joints paler. Head rather closely, not coarsely punctate. Thorax nearly twice as wide at base as long, narrowed in front, sides arcuate, disc convex, the punctures moderate and rather closely placed. Elytra a little wider at base than the thorax, humeri rounded, disc convex, punctuation a little coarser and closer than on the thorax, the vitta broad, as wide at middle as the distance to the suture, at base incurved, a broad, short, post humeral branch, apical third strongly arcuate and incurved. Body beneath piceous, abdomen sparsely punctate. Femora piceous, tibiæ pale, brown at middle, tarsi pale. Length .10—.12 inch.; 2.5—3 mm. Plate VI, fig. 16.

Male.—Last ventral slightly sinuate each side, a broad and deep triangular impression at apex. Antennæ as in *vittata*.

Female.—As in *vittata*.

This is the largest and most robust of our species. It is more especially related to *vittata*, but has a much broader vitta, is larger and of more robust form. The ventral characters of male also differ.

Occurs in Oregon and Nevada.

5. **P. robusta** Lec.—Oblong oval, moderately convex, similar in form to *vittata*, piceous, surface shining, slightly æneous, elytra with a broad yellow vitta dilated at humerus and broadly dilated at tip, reaching the sides and apex. Antennæ as long as half the body, piceous, three basal joints pale. Head alutaceous, indistinctly punctate. Thorax nearly twice as wide as long, slightly narrowed in front, sides arcuate, disc convex, alutaceous, coarsely, deeply and closely punctate. Elytra scarcely wider at base than the thorax, humeri obliquely rounded, surface rather more coarsely punctured at base than the thorax, gradually more finely to apex, the yellow vitta broad, parallel with the suture the greater part of its length, incurved at the scutellum, a broad post-humeral process, the apical third broadly expanded, reaching the apex and side margin. Body beneath piceous abdomen sparsely punctate. Femora piceous, tibiæ and tarsi paler. Length .08 inch.; 2 mm. Plate VI, fig. 18.

Male.—Last ventral slightly sinuate each side, a very deeply impressed median line extending two-thirds the length of the segment. Antennæ with joints 2-3-4 very nearly equal in length, the fourth slightly broader, fifth as long as the two preceding, the apical free angle prolonged, sixth short, oval, 7-10 nearly equal, gradually broader, eleventh longer.

Female.—Has not been seen.

While not different in form from *vittata*, and therefore scarcely meriting its trivial name, the species is readily known by the very broad yellow vitta, which at its apical third reaches side, apex and suture.

The sexual characters of the male are very well marked, and will enable it to be at once distinguished.

Occurs at Garland, Colorado; collected by Mr. E. A. Schwarz.

6. **P. denticornis** n. sp.—Elongate oval, rather feebly convex, entirely piceous, shining, surface with slight æneous lustre. Antennæ half as long as the body, piceous, second and third joints paler. Head alutaceous, rather closely punctate. Thorax nearly twice as wide as long, slightly narrowed in front, sides feebly arcuate, disc convex, alutaceous, moderately, coarsely, closely punctate. Elytra slightly wider at base than the thorax, humeri rounded, surface shining, not alutaceous, the punctures less coarse than on the thorax, equally dense, but less impressed, smoother near the apex. Body beneath piceous, abdomen sparsely punctate. Femora piceous, tibiæ and tarsi brownish. Length .10 inch.; 2.5 mm.

Male.—Last ventral feebly sinuate each side, the middle with a deep, but short, triangular impression. Antennæ with joints 2-3-4 nearly equal in length, the

fourth broader, fifth still longer and more dilated, sixth short, conical, its lower angle prolonged in an acute process, 7-10 equal in length, but gradually broader, eleventh longer. Plate VI, fig. 19.

Female.—Has not been seen.

While this species has the strongly dilated antennal joints of the vittate species, the form of body and uniform color approach it to *albionica*. It is the only species known to me in which the male sixth joint has any marked peculiarity.

Occurs in California; region unknown.

7. **P. Ulkei** n. sp.- Oblong oval, moderately convex, piceous black, shining, without metallic lustre; legs, excepting the posterior femora, reddish brown. Antennæ half as long as the body, piceous, three basal joints pale. Head not punctate. Thorax one-third wider than long, very little narrowed in front, sides arcuate, disc convex, sparsely regularly punctate, surface alutaceous. Elytra scarcely wider than the thorax, humeri obliquely rounded, a distinct depression within the umbone, disc convex, more coarsely, closely and deeply punctate than the thorax, a little smoother near the apex, surface shining. Body beneath piceous, abdomen sparsely punctate. Legs reddish brown, posterior femora piceous. Length .10 inch.; 2.5 mm.

Male.—Last ventral segment distinctly sinuate each side, middle lobe moderately prominent, a deep triangularly oval impression extending more than half the length of the segment. Antennæ with joints 2-3-4 gradually shorter and broader, fifth as long as the preceding two and more than twice as broad, sixth equal to fourth, 7-10 longer and equal, eleventh longer. Plate VI, fig. 23.

This species is rather more robust than any other known to me, recalling the form of some Chætocnema.

There will be no difficulty in distinguishing the male of this species from any in Series A (1) by the broad fifth joint, (2) the absence of elytral vitta and (3) the simple form of sixth joint. It is, therefore, most nearly allied to *denticornis*.

For the unique I am indebted to my friend Ulke, without whose assistance my studies in the Halticini would have been far more incomplete than they now are.

Occurs in Ohio.

8. **P. decipiens** n. sp.—Elongate oval, rather feebly convex, piceous black, shining, without metallic lustre, elytra often with a short, indistinct yellow line one-third from apex. Antennæ half as long as the body, piceous, three basal joints paler. Head alutaceous, obsoletely finely punctulate. Thorax nearly twice as wide as long, slightly narrowed in front, sides feebly arcuate, disc convex, coarsely, deeply and closely punctate, the surface distinctly alutaceous. Elytra wider at base than the thorax, humeri rounded, disc feebly convex, the punctures coarser and deeper than those of the thorax, very closely placed and but little finer near the apex, surface shining, not alutaceous. Body beneath and legs piceous, abdomen almost entirely smooth. Length .08—.10 inch.; 2—2.5 mm.

Male.—Last ventral with a feeble sinuation each side, a moderately deep, elongate triangular impression. Antennæ with joints 2–3–4 nearly equal in length, the fourth slightly broader, fifth longer and very little broader, sixth shorter than second, 7–10 equal in length, but gradually broader, eleventh longer.

Female.—Last ventral simple. Antennæ with joints 2–3–4 equal in length and thickness, fifth longer, sixth equal to fourth, 7–11 as in the male.

In two specimens before me there is a short yellow line midway between the suture and side, one-fourth from apex, a third has the elytra entirely black. The antennæ do not show the marked sexual differences observed in the vittate species, and in this respect is very like *albionica*. While this species and *albionica* are closely related by description, this is more convex, more coarsely punctate, without æneous lustre and less elongate. When immaculate it resembles *denticornis*, and the sexual characters must be relied upon to separate them.

Occurs in Oregon and Washington Territory.

9. **P. albionica** Lec.—Elongate oval, narrow, depressed, piceous, surface with very distinct æneous lustre. Antennæ half as long as the body, slender, piceous, three basal joints paler. Head moderately closely punctate. Thorax not quite twice as wide as long, narrowed in front, sides arcuate, disc moderately convex, the punctuation relatively coarse and densely placed. Elytra wider at base than the thorax, humeri obtuse, disc subdepressed, more coarsely punctured than the thorax, less dense and more shining. Body beneath piceous shining, abdomen with very few punctures. Legs piceous, tibiæ and tarsi brown. Length .06–.08 inch.; 1.5—2 mm.

Male.—Last ventral not sinuate each side, a short and broad triangular impression at the apical margin Antennæ with joints 2–3 equal, fourth a little longer, fifth a little longer and stouter, sixth equal to fourth, 7–10 equal, gradually broader, eleventh longer. Plate VI, fig. 22.

Female.—Last ventral simple. Antennæ with fifth joint a little longer than fourth or sixth, otherwise as in the male.

This species and *pusilla* are the smallest in our fauna, their form narrowest and most depressed. They are closely allied and separable with certainty by the sexual characters alone.

In Mr. Ulke's cabinet is a green-blue specimen from Colorado which is possibly a distinct species, but there are no strongly defined characters to separate it from *albionica*, it is therefore left to the future.

10. **P. ramosa** Crotch.—Elongate oval, moderately convex, piceous, with very faint æneous lustre, each elytron with a sinuous yellow-white vitta. Antennæ half as long as the body, piceous, joints 2–3 and underside of first pale. Head with very few punctures between the eyes. Thorax nearly twice as wide as long, narrower in front, sides arcuate, disc convex, the punctures moderately

coarse and rather closely placed. Elytra a little wider at base than the thorax, humeri rounded, disc convex, punctures coarser than those of the thorax, but not so closely placed, each elytron with a slender sinuous vitta, incurved at base, a post-humeral branch, near the tip the vitta joins a narrow crescentic spot, one end of which points anteriorly the other incurved toward the suture. Body beneath piceous, abdomen nearly smooth. Legs entirely piceous. Length .08 inch.; 2 mm. Plate VII, fig. 12.

Male.—Last ventral very feebly sinuate on each side, a vague triangular impression at apex. Antennæ as in *bipustulata.*

Female.—As in *bipustulata.*

This species resembles *vittata*, but may be known by the form of the apical portion of the vitta. The form of the fifth joint of the antennæ will distinguish either sex from that species.

Occurs at Lakeport, California (Crotch).

11. **P. bipustulata** Fab.—Oblong oval, moderately robust, piceous, without metallic lustre, each elytron with two large, irregularly oval, yellow spots, one humeral, the other subapical. Antennæ half as long as the body, distinctly thicker externally, piceous, the basal five joints paler. Head sparsely, finely punctate, not alutaceous. Thorax one third wider than long, narrowed in front, sides feebly arcuate, disc convex, the punctures moderate, not closely placed, surface very indistinctly alutaceous. Elytra distinctly wider at base than the thorax, humeri obtusely rounded, the punctures coarser than those of the thorax, but gradually finer toward the apex, and with a faint tendency to a strial arrangement at middle, humeral spot oval, touching the base, not including the umbone, subapical spot elongate oval, but narrower. Body beneath piceous, abdomen sparsely punctate Legs rufotestaceous, the posterior femora darker beneath. Length .08—.10 inch.; 2—2.5 mm. Plate VI, fig. 13.

Male.—Last ventral distinctly sinuate each side, middle lobe moderately prominent and with a rather deep, triangularly oval concavity. Antennæ as in *Lewisii*, but stouter.

Female.—Last ventral simple, antennæ as in the male.

This species could only be confused with some of the forms of *vittata* in which the vitta is broken at middle, but in either sex the form of the fifth antennal joint would easily distinguish it together with the pale legs. I have a specimen, given me by Mr. Ulke, without elytral spots.

Occurs from Pennsylvania to South Carolina.

12.—**P. chalybeipennis** Crotch.—Elongate oval, moderately robust, beneath piceous, above bright blue Antennæ longer than half the body, the outer joints dark brown, basal five joints rufotestaceous. Head sparsely, but very distinctly punctate. Thorax one-half wider than long, narrowed in front, sides rather strongly arcuate, disc convex, alutaceous, moderately closely, but not coarsely punctate. Elytra scarcely wider than the thorax, humeri obliquely rounded, punctuation similar to that of the thorax and equally close, with larger punctures forming quite distinct striæ near the base, five being very evident,

surface not alutaceous. Body beneath piceous, abdomen sparsely punctate. Anterior and middle femora brown, the posterior piceous with bluish green surface, tibiæ and tarsi testaceous, the posterior tibiæ more dilated than usual at tip. Length .10—.12 inch.; 2.5—3 mm.

Male.—Last ventral sinuate each side, the middle lobe moderately prominent and concave, a median impressed line near the base of the segment. Antennæ as in *Lewisii*.

Female.—Last ventral with a slight longitudinal impression at apex. Antennæ as in the male.

This is the largest and most robust of all the species with simple antennæ and unicolored elytra. It is readily known by its uniform blue color and the stouter hind tibiæ.

Occurs occasionally in considerable abundance on the sea-coast of New Jersey; Massachusetts to Florida.

13. **P. æneicollis** Crotch.—Elongate oval, form rather slender, moderately convex, piceous, head and thorax with a cupreous lustre, elytra greenish or bluish. Antennæ slender, half as long as the body, piceous, joints 2–5 and underside of first rufotestaceous. Head sparsely, indistinctly punctulate. Thorax one-third wider than long, narrowed in front, sides irregularly arcuate, disc convex, the punctuation moderate in size, closely placed, the surface alutaceous. Elytra wider at base than the thorax, humeri obtuse, disc moderately convex, the punctures rather coarser than those of the thorax, but less closely placed, becoming finer near the apex, near the base there are conspicuously coarser punctures tending to form striæ, that just within the umbone quite evident. Body beneath piceous, abdomen sparsely punctate. Legs piceous, the tibiæ and tarsi brownish testaceous. Length .08—.10 inch.; 2—2.5 mm.

Male.—Last ventral slightly sinuate each side, a narrow, feeble, triangular impression at middle. Antennæ simple, as in *Lewisii*.

Female.—Last ventral simple. Antennæ as in the male.

This species is especially related by the characters of the table to *chalybeipennis*. It is less robust, more elongate, differently colored, and with quite slender posterior tibiæ. The larger punctures do not form such distinct rows as in that species.

Occurs in Kansas and Texas.

14. **P. Lewisii** Crotch.—Elongate oval, moderately convex, piceous, surface with dark bluish lustre. Antennæ slender, half as long as the body, piceous, joints 2–5 pale. Head sparsely, indistinctly punctate. Thorax more than half wider than long, slightly narrowed in front, sides arcuate, disc convex, punctures moderate in size, not closely placed, surface not alutaceous. Elytra scarcely wider at base than the thorax, humeri broadly rounded, disc convex, the punctures coarser than those of the thorax, and therefore apparently more closely placed, finer toward the apex. Body beneath piceous, shining. Abdomen very sparsely punctate. Legs piceous, tibiæ and tarsi brown. Length .08—.10 inch.; 2—2.5 mm.

Male.—Last ventral distinctly sinuate each side, the middle lobe moderately prominent, slightly concave and with a broadly triangular impression. Antennæ with joints 2–10 scarcely different in length, eleventh a little longer.

Female.—Last ventral with a very faint impression near the apex. Antennæ as in the male.

Among the species with simple antennæ and non-vittate elytra two have the elytral punctuation composed of equal punctures, the present species and *pusilla*. The latter is smaller, more depressed, the surface distinctly brassy, the thorax small and the punctuation closer.

Specimens occur with scarcely any bluish surface lustre, and those from Nevada have the first five joints of the antennæ more conspicuously pale.

Occurs in Colorado, Illinois (Crotch), Texas, Nevada and adjacent regions of California.

15. **P. pusilla** n. sp.—Form narrow, elongate, depressed, piceous, surface with distinct æneous lustre. Antennæ slender, half as long as the body, piceous, joints 2–3 paler. Head scarcely visibly punctate. Thorax less than twice as wide as long, widest at middle, sides arcuate, apex slightly narrower than base, disc convex, surface shining, the punctures moderate, closely placed, but not convex. Elytra wider than the thorax, humeri obtuse, punctuation coarser than that of the thorax, closely placed, very little finer near the apex, but less dense, surface shining. Body beneath and legs piceous, abdomen sparsely punctate. Length .06—.08 inch.; 1.5—2 mm.

Male.—Last ventral with a feeble triangular impression in the apex.

Female.—Last ventral simple.

The antennæ are alike in the sexes. The joints 3–10 vary but little in length, although very slightly broader externally.

This species could only be confounded with *albionica*, which it resembles in form, size and color. It is, however, more shining, the head nearly smooth, thorax and elytra less densely punctured, the latter never scabrous.

Occurs from Dakota to Texas, Arizona, southern California and Nevada.

16. **P. picta** Say.—Oval, slightly oblong, feebly convex; head, thorax and legs pale reddish yellow; abdomen piceous, elytra bright bluish green, surface shining. Antennæ a little longer than half the body, slightly thicker externally, basal joints pale, outer joints fuscous. Head smooth, frontal carina and tubercles distinct, a vague longitudinal impression of the vertex. Thorax nearly twice as wide as long, distinctly narrowed in front, sides arcuate, slightly obliquely truncate at the front angles, disc moderately convex, the punctuation very fine, sparse and indistinct. Elytra a little wider at base than the thorax, humeri rounded, umbone smooth, not brownish, surface moderately closely,

indistinctly punctate on the disc, smoother at sides and apex, the punctures fine, but intermixed. Abdomen piceous, indistinctly punctate. Legs yellowish, the posterior femora often fuscous. Length .08 inch.; 2 mm.

This species is so unlike the others in our fauna that I place it in Phyllotreta with regret, but after repeated examination I see no other course to pursue. It is true that viewed in certain light there appears to be a vague ante-basal depression, but this is purely deceptive. As the choice of position seems to be either here or in Haltica, it is preferably placed here. It was placed by Crotch in Aphthona, but the form of hind tibia is not as seen in that genus.

Occurs in North Carolina, Florida, Georgia and Texas.

APHTHONA Chev.

Head inserted as far as the eyes, front carinate between the antennæ and with tubercles above it, clypeus broadly emarginate, labrum arcuate in front. Maxillary palpi moderate in length, the penultimate joint oval, truncate, the terminal joint more slender, longer and acute at tip. Antennæ slender, longer than half the body, first joint stout, claviform, second elongate oval, third more slender and a little longer, joints three to seven gradually longer, eight to ten slightly shorter, eleventh longer than tenth, acute at tip. Thorax slightly broader than long, apex truncate, base arcuate, scutellum transversely oval. Elytra wider at base than the thorax. Prosternum moderately separating the coxæ, slightly broader behind them, the cavities widely open behind. Ventral segments free. Legs moderately long, tibiæ with outer edge rounded, the posterior tibiæ depressed near apex, the lower edge at tip emarginate or bilobed, the outer lobe terminated by a spur. Tarsi moderate, the first joint a little shorter than the others together, the claws not appendiculate at base.

The essential character of this genus is in the structure of the apex of the hind tibiæ. The tip is said to be bilobed, *i. e.*, there is a notch of the edge immediately in front of the tarsal insertion which probably enables the tarsus to move more freely to the front, while in Longitarsus the motion is confined entirely to a folding backward against the posterior edge of the tibia.

The species composing Aphthona, judging from the European monographs, seem to be much less homogeneous in aspect than the other genera of the tribe. With this fact known there seems to be reason why the species known in our fauna should not be associated

The following species are known to me:

Form oblong oval, rather depressed, elytra blue; beneath piceous; head, thorax and legs pale yellowish red ..... **texana.**

Form short, robust, entirely rufotestaceous, shining.

Thorax more than half wider than long, sides arcuate; antennæ slender. **socia.**

Thorax very little wider than long, sides nearly straight; antennæ stout. **insolita.**

A. texana Crotch.—Oblong oval, not very convex; head, thorax and legs bright reddish yellow, abdomen and elytra piceous, the latter with bluish or purplish lustre. Antennæ rufotestaceous, slightly darker at apex. Head faintly alutaceous, impunctate, frontal carina well marked, the tubercles flat. Thorax one-half wider than long, scarcely narrowed in front, sides feebly arcuate, disc moderately convex, the punctuation rather fine, not closely placed, a little coarser along the base. Elytra wider at base than the thorax, humeri rounded, umbone moderately prominent, smooth, disc irregularly punctate, becoming much smoother at apex, and with much coarser punctures forming irregular striæ near the base. Abdomen piceous shining, very sparsely punctate and pubescent. Length .08—.10 inch.; 2—2.5 mm.

The males have the first joint of the anterior tarsi slightly dilated, the last ventral segment obtuse at apex and the antennæ a little stouter. Chapuis states that the sutural angle is also more obtuse, but this is scarcely evident in our species. By its form and elytral sculpture this species represents the *ovata* Foud. of southern France.

Occurs in Texas, Colorado and Nebraska.

A. socia n. sp.—Oval, slightly oblong, convex, rufotestaceous, shining. Antennæ slender, longer than half the body, rufotestaceous, the second joint a little longer than the fourth, third a little shorter. Head extremely finely alutaceous, impunctate. Thorax one-half wider than long, not narrowed in front, sides rather broadly arcuate, anterior angles obliquely truncate, with distinct post-apical angulation, hind angles distinct when seen from above, base arcuate, disc convex, the punctuation fine and indistinct, almost obliterated in front and at sides. Elytra distinctly wider at base than the thorax, humeri obtusely rounded, umbone distinct, sutural angles well marked, disc convex, a slight depression divided by the suture very near the apex, punctuation extremely fine, confused with vague indications of strial arrangement near the suture at base, a very distinct stria of punctures at the sides a little distance from the margin. Body beneath and legs colored as above. Length .08 inch.; 2 mm.

The unique specimen before me is a female, and has the terminal half of the last ventral segment paler, so that it appears at first sight to be two segments.

The very shining surface of this species will render it easily known among all the species of the group, in connexion with the antennæ.

Occurs at Columbus, Texas.

I have before me a specimen which I am quite convinced is the male of the above. It differs in having the elytra very distinctly alutaceous so as to be subopaque with a greasy aspect, the punctuation less distinct. The apices of joints 8–9–10 of the antennæ are prolonged on their lower edge so as to be acutely serrate. In other respects the two specimens agree, the former being the female, the latter a male. Occurs with the preceding. Pl. VII, fig. 19.

A. insolita Mels.—Oval, slightly oblong, convex, rufotestaceous, shining. Antennæ longer than half the body, stout, the first and last two joints testaceous, the others brown. Head smooth, impunctate. Thorax one-fourth wider than long, not narrowed in front, sides nearly straight, anterior angles obliquely truncate, with distinct post-apical angulation, base feebly arcuate, disc convex, smooth and polished. Elytra distinctly wider at base than the thorax, humeri obtusely prominent, umbone distinct, sutural angles distinct, but obtuse, disc convex, the punctuation excessively fine and visible only at base near suture, where one vague stria is seen, otherwise polished. Body beneath and legs similar in color to upper surface, tarsi brown. Length .07—.08 inch.; 2 mm.

The antennæ are stouter than usual in the group Aphthonæ; the first joint is oval, suddenly narrowed at base, second oval, narrower and about half as long, third more slender not longer, joints 4–10 gradually very little longer and broader; eleventh longer, acuminate at tip.

The occurrence of paler joints at the tip of the antennæ seems to be a rare character in the Halticini, but the extreme tip of the eleventh joint is black, although the remainder as well as the tenth is quite pale.

This insect was originally described by Melsheimer as a doubtful Sphæroderma, and later Crotch made a new genus—*Cerataltica*, and placed by him in such a position as to lead to the inference that the anterior coxal cavities are closed. The facts are, however, quite the reverse, and the only character of moment not possessed by the other Aphthonæ is found in the moderately stout antennæ.

In general appearance and color the insect resembles *Longitarsus rubidus*, but the very polished surface is like the preceding species.

Occurs in Pennsylvania (Melsheimer) and Capron, Florida (Schwarz).

The following species has not been identified:

A. subglobosa Motsch.—Nigro-picea, subtiliter punctatissima; elytris subglobosis, antennarum basi, tibiis tarsisque rufo-piceis. Length two-thirds, width three-fifths of a line.

It resembles a little *A. euphorbiæ* Fab., but it is much broader and of a browner black color.

The thorax, the sides of which are rounded, shows some sparse punctures feebly impressed. The elytra are twice as wide as the thorax, slightly globose and feebly prolonged at the extremity, they are rather strongly punctured. The base of the antennæ, the tibiæ and tarsi are of a reddish black color.

From California.

The figure given, although very poor, looks very like a Chætocnema. It is very likely that this is one of the things obtained from Dupont, and that it was collected near the Rio Grande.

Group XVI.—DIBOLIÆ.

Antennæ 11-jointed. Anterior coxal cavities open behind. Head retracted. Thorax without any ante-basal impressions. Posterior tibiæ with a long, rather broad terminal spur, which is more or less deeply emarginate at apex. Pl. VII, fig. 17.

These few characters amply define the group. In fact the form of the posterior tibial spur of itself from a sufficient limitation.

Two genera constitute this group,—Dibolia and Megistops, the latter distinguished by having the eyes contiguous on the vertex. Several species were described by Boheman and credited to California, but there can be no doubt that they should be referred to South America.

DIBOLIA Latr.

Head rounded, retracted within the apex of the thorax. Eyes slightly reniform. Front carinate, the frontal tubercles distinct. Maxillary palpi rather slender, the terminal joint of slender conical form nearly as wide at base as the third joint. Antennæ at least half as long as the body, slightly stouter externally. Thorax broader than long and much narrowed in front. Elytra oval, not wider at base than the thorax, with regular striæ of punctures. Prosternum narrowly separating the coxæ, the anterior coxal cavities open behind. Legs moderate in length. Posterior thighs strongly dilated, the tibiæ slender at base, broader at the extremity, terminated by a rather long and broad spur, which is deeply emarginate at tip; the tibia grooved on its outer edge and denticulate near the tip. Tarsi slender, first joint one-third the length of the tibia, the claws appendiculate.

The males are said by Chapuis to differ from the females in having the first joint of the anterior tarsi dilated and the pygidium transversely striate.

Four species occur in our fauna:

Apices of elytra very deeply sinuous at apex ..... **sinuata.**
Apices of elytra conjointly rounded.
Antennæ rufotestaceous; legs (except the posterior femora) rufotestaceous or brownish; thorax very distinctly punctate.
Form more oblong; interstrial spaces with very few punctures.. **borealis.**
Form more ovate; interstrial spaces with numerous fine punctures.. **ovata.**
Antennæ and legs piceous; thorax very indistinctly punctate.
Thorax greenish black, elytra blue green..... **libonoti.**

D. sinuata n. sp.—Broadly oval and convex, very like a *Phædon*, beneath piceous, thorax above black bronze, elytra bluish green. Antennæ entirely rufotestaceous. Head rufescent, not distinctly punctate. Thorax more than twice as wide at base as long, narrowed in front, sides moderately arcuate, disc moderately convex, the surface slightly rugulose, the punctuation moderate in size, sparse and indistinct. Elytra not wider at base than the thorax, broadly oval, the apices deeply sinuous, the sutural angle obtuse, disc convex, disc striatopunctate, striæ not impressed, punctures moderately coarse and deep, but not closely placed, intervals flat, moderately closely, finely punctate, with a row of distant coarser punctures, finer than those of the striæ. Body beneath piceous. Abdomen moderately closely punctate and slightly wrinkled transversely. Legs brownish, tibiæ and tarsi a little paler. Length .12 inch.; 3 mm.

This species is even more broadly oval than *ovata*, resembling at first sight *Phædon viride*. It is especially distinguished by the rather deep sinuation of the apices of the elytra. This character seemed at first sight as if an accidental deformity, but the exact symmetry of the two sides, together with the other characters, have satisfied me that the species is well founded.

One specimen, Dallas, Texas.

D. borealis Chev.—Oval, slightly oblong, convex, piceous, surface distinctly bronzed, either æneous, slightly cupreous, or bluish. Antennæ pale rufotestaceous. Head shining, sparsely, indistinctly punctate. Thorax rather more than twice as wide at base as long, apex but little wider than the length, sides arcuate, disc convex, closely punctate, with coarse and fine punctures intermixed. Elytra not wider at base than the thorax, the sides of both continuous, umbone moderately prominent, disc convex, with striæ of coarse punctures, which are rather closely placed, some of the striæ rather irregular, intervals broad and flat, with but few fine punctures, the alternate intervals 2-4-6 with coarser punctures, striæ not obliterated at apex. Body beneath and posterior femora piceous, slightly bronzed. Abdomen shining, sparsely punctate. Anterior four legs and posterior tibiæ rufotestaceous. Length .12 inch.; 3 mm.

This insect is so well known as not to require special comment. The elytral sculpture is somewhat variable, the striæ being quite regular in some, although the greater number have the third and sixth striæ more or less confused.

Widely distributed over the entire eastern United States and Canada. A specimen in my cabinet from Nevada.

This species is said to occur in Mexico by Mr. Jacoby, but from the remarks it is probable that both this species and *ovata* are included under the one name. At all events the figure represents the latter more nearly as far as the form and striæ are concerned.

D. ovata Lec.—Oval, moderately convex, piceous, with æneous or cupreous surface lustre. Antennæ pale rufotestaceous. Head moderately punctate. Thorax similar in form to *borealis*, equally densely punctate with intermixed punctures. Elytra more oval than in *borealis*, the punctures of the striæ finer, the intervals flat, with numerous fine punctures. Body beneath and legs as in *borealis*. Length .12 inch.; 3 mm.

This species is closely related to *borealis*, and was considered by Crotch merely a variety, but the more oval form, the fine striæ of the punctures (which are sometimes obliterated posteriorly) and the finely punctate intervals seem to make it a distinct species.

Occurs in California and Nevada.

D. libonoti n. sp.—Oval, slightly oblong, convex, piceous, head and thorax blackish bronze, elytra blue-green. Antennæ piceous. Head sparsely, indistinctly punctate. Thorax more than twice as wide at base as long, narrowed in front, sides feebly arcuate, disc convex, the punctuation indistinct, but intermixed. Elytra not wider at base than the thorax and continuing the curve of the sides, umbone small, disc convex, the striæ composed of fine, not closely placed punctures, the intervals flat, finely, but indistinctly punctulate. Body beneath piceous. Abdomen sparsely punctate. Legs piceous, the posterior femora slightly bluish. Length .10 inch.; 2.5 mm.

A smaller and less convex species than the other two and with faintly punctured thorax, which is differently colored from the elytra. The legs are entirely piceous.

Occurs in Arizona (Morrison).

Group XVII.—PSYLLIODES.

Form oblong. Antennæ 10-jointed, widely distant at base, inserted against the inner border of the eyes. Anterior coxal cavities closed behind. Ventral segments free. Posterior tarsi inserted above the end of the tibia and slightly to the outer side, the first joint very long, the last slender, not inflated, the claws rather long, slender and simple.

But one genus constitutes this group, having characters sufficiently obvious to make it easily recognized without discussion. On one point sufficient stress does not seem to be laid, and that is in reference to the insertion of the antennæ. Chapuis has indicated one group in which the insertion of the antennæ against the inner border of the eyes is made the important character. Here a similar character has been passed over in silence. The antennæ of Psylliodes are inserted as close to the eye as is possible without causing an emargination.

The fauna of Europe is more than ten times richer in species than our own, the disparity being greater than in either Chætocnema or Longitarsus.

PSYLLIODES Latr.

Head oval, deeply inserted, the front inclined, or nearly vertical, without carina, but forming a broad flat plate, tubercles not distinct, usually with an arcuate impressed line, which marks the lower edge of the tubercles (entirely absent in *sublævis*), clypeus truncate, labrum moderately prominent, entire. Antennæ 10-jointed, separated at base, inserted at the inner border of the eye, filiform, slightly thicker externally, first joint slender clavate, joints 2–3–4 nearly equal, 5–9 gradually slightly shorter, tenth longer, acute at tip. Maxillary palpi slender, second joint slender clavate, third obconical, acute at tip. Thorax transverse, narrowed in front, base broadly arcuate, with distinct marginal line, obliterated at middle. Elytra oblong oval, usually widest slightly in front of middle. Prosternum moderately separating the coxæ and not depressed between them, dilated at apex and with the epimera closing the cavities. Mesosternum moderately long, slightly oblique Legs moderate in length, posterior femora much thickened, deeply sulcate beneath for the tibiæ. Anterior and middle tibiæ slender, the outer edge rounded, posterior tibiæ broader toward apex, the posterior edge sinuate near apex and with a border of short ciliæ, the tip prolonged beyond the insertion of the tarsi and terminated by a short spur (Pl. VII, fig. 13). Posterior tarsi long and slender, the first joint more than half the length of the tibiæ, the third joint narrowly bilobed, the fourth slender and with moderately long simple claws.

This genus is probably one of the most easily recognized of the tribe by the structure of the antennæ and posterior tibiæ. The apex of the posterior tibia is not simply prolonged beyond the insertion of

the tarsi, but is excavated slightly externally. These tarsi resemble those of Longitarsus, although the first joint is really longer in proportion to the tibia.

In the "Genera" Chapuis states that the anterior coxal cavities are open, but the error has already been noticed, and, in 1873, Crotch had placed the genus in the series with closed cavities.

The European species do not seem to exhibit any well defined sexual characters, but these are quite well marked in all our species, although less distinct in *sublævis*.

The following species are known to inhabit our fauna:

Last ventral segment of male distinctly impressed; first joint of anterior tarsi broadly dilated ..... **punctulata.**

Last ventral of male convex, not impressed.

Elytra with very distinct interstrial punctures, those of the striæ well impressed; abdomen numerously punctate; first joint of anterior tarsi male rather broadly dilated.

Above uniform in color, dark bronze, form distinctly oblong... **convexior.**

Above bicolored, thorax black bronze, elytra blue-green; form more evidently ovate..... **elegans.**

Elytra without distinct interstrial punctures, those of the striæ fine and feebly impressed; first joint of anterior tarsi male not dilated in oval form. **sublævis.**

The first two species have very wide distribution, the other two are more restricted.

P. punctulata Mels.—Form elongate oval, little narrower in front, moderately convex piceous, surface dark bronzed shining. Antennæ a little longer than half the body, three basal joints pale, the outer joints brownish. Head sparsely indistinctly punctate, the surface usually slightly alutaceous. Thorax a little more than half wider at base than long, distinctly narrowed in front, sides feebly arcuate, distinctly obliquely truncate at front angles with feeble post-apical angulation, disc moderately convex, the punctures rather coarse, but not dense, the intervals usually distinctly alutaceous. Elytra not wider at base than the thorax, humeri obliquely rounded, sides moderately arcuate, widest in front of middle, disc moderately convex, punctato-striate, striæ feebly impressed, punctures coarse, rather close, but not serrate, intervals slightly convex, scarcely wider than the striæ, each with a single series of fine punctures. Body beneath piceous, shining. Abdomen distinctly punctate and alutaceous, the punctures coarser, more deeply impressed and sparser along the middle, denser at the sides, sparsely pubescent. Anterior and middle femora piceous, the posterior distinctly bronzed, the tibiæ rufotestaceous, darker at middle. Length .08—.10 inch.; 2—2.5 mm.

The male has the first joint of the anterior tarsi broadly dilated. The last ventral segment is sinuate each side, the middle of disc near apex with a semi-oval depression.

This species is the commonest form taken everywhere in the eastern region. It is the most elongate of the species. The thorax is usually comparatively coarsely and closely punctate with the intervals distinctly alutaceous, but the specimens from the warmer regions are scarcely alutaceous. Specimens rarely occur with the thorax rather finely and sparsely punctate. The punctures of the elytral striæ are always closely placed, almost crenate, and by this means (in the absence of the ♂) the species may be separated from *convexior*.

Widely distributed: Massachusetts and Canada, westward to Washington, Vancouver and California, Nevada, Utah, Kansas, Colorado and Texas.

P. convexior Lec.—Oblong oval, moderately convex, piceous, shining, surface distinctly bronzed. Antennæ piceous, three basal joints testaceous. Head shining, sparsely punctate. Thorax nearly twice as wide at base as long, distinctly narrowed in front, sides nearly straight, feebly obliquely truncate near the front angles, a slight post-apical angulation, disc moderately convex, sparsely finely punctate at middle, a little more coarsely at the sides, surface shining. Elytra not wider at base than the thorax, humeri obliquely rounded, umbone moderate, disc convex, striato-punctate, striæ not impressed, punctures rather coarse and well separated, becoming gradually finer toward the apex, intervals flat, the inner three with numerous interstrial punctures, the outer with but a single row. Body beneath piceous. Abdomen indistinctly alutaceous, sparsely pubescent, the punctures moderate, numerous, but sparser at middle. Legs as in *punctulata*. Length .08--.10 inch.; 2—2.5 mm.

The first joint of anterior tarsus is broadly dilated in the male: the last ventral segment is convex, without impression, the apex rather obtuse.

This species is of rather broader and more convex form than *punctulata;* has the thorax always sparsely and finely punctured, the elytral striæ not impressed, and the punctures always well separated.

Occurs especially in the south of California, thence north to Washington and eastward to Texas, Georgia, Florida, Illinois and Missouri and District of Columbia. On the whole more southern in its distribution than *punctulata*.

P. elegans n. sp.—Oval, slightly oblong, moderately convex, head and thorax black bronze, elytra bluish green, shining. Antennæ rufotestaceous, scarcely darker externally. Head punctate, slightly alutaceous. Thorax nearly twice as wide at base as long, narrowed in front, sides nearly straight, obliquely truncate near the front angles, with slight post apical angulation, disc moderately convex, shining, punctures moderate, not closely, but very regularly placed. Elytra not wider at base than the thorax, humeri oblique, umbone moderate,

disc striato-punctate, striæ not impressed, the punctures moderately coarse, round and well separated, intervals flat, with numerous fine punctures, equivalent on all to more than a single row. Body beneath piceous, faintly bronzed. Abdomen slightly alutaceous, distinctly punctate, sparsely pubescent Anterior and middle legs rufotestaceous, the femora a little darker, posterior femora brown or piceous, the tibiæ and tarsi pale. Length .10 inch.; 2.5 mm.

The male characters are as in *convexior*.

The form of this species is still a little broader than *convexior*, and may at once be known by its colors. The elytral intervals are more numerously punctulate than any other of our species.

Occurs in Florida and Kansas (Ulke).

P. sublævis n. sp.—Oblong oval, moderately convex, piceous, shining, surface distinctly bronzed. Antennæ slender, rufotestaceous, the seven outer joints piceous at their apices. Head sparsely obsoletely punctate. Thorax one-half wider than long, narrowed in front, sides slightly arcuate, obliquely truncate at front angles with distinct post-apical angulation, disc moderately convex, the punctures small, sparsely placed, feebly impressed. Elytra slightly wider at base than the thorax, humeri obtusely rounded, umbone moderate, disc moderately convex, striato-punctate, the striæ not impressed, the punctures fine, not close, entirely obliterated at apex, intervals flat, the interstrial punctures almost entirely obliterated. Body beneath piceous, faintly bronzed, shining, with very few hairs, punctures indistinct, but when present forming a row of distant punctures along the anterior and posterior borders of the segments. Anterior and middle legs and posterior tibiæ rufotestaceous, the femora a little darker, posterior femora piceous. Length .14 inch.; 3.5 mm.

In the male the first joint of the anterior tarsus, although slightly broader than in the female, is not oval as in the other species. The last ventral is convex, the apical border slightly sinuate each side, the surface smooth.

This species is the largest in our fauna. It may be known by the comparatively smooth surface both above and below, and by the elytra distinctly broader at base than the thorax, as well as the feeble sculpture.

Occurs in southwestern Utah; collected by Dr. Edward Palmer.

The following Halticide has not been identified:

Altica liturata Oliv. Ent. vi. p. 707, pl. iv, fig. 7.—Oval, pale yellow; elytra with many short brown lines.

It resembles *A. atricilla* [Longitarsus] in form and size. Antennæ fuscous, with the base pale. Head testaceous, eyes large, black. Thorax smooth, pale yellow, without spots. Elytra smooth, pale yellow, the suture and four abbreviated lines fuscous. Body beneath pale.

Found in Carolina. Palisot de Beauvois.

The figure represents a rather broadly oval species, entirely pale yellow; the suture of the elytra narrowly bordered with fuscous, on each elytron two moderately long fuscous lines parallel with the suture, external to these two shorter ones; there is a short line also at the humerus. The size as nearly as can be ascertained is .12 inch. or 3 mm. Plate VI, fig. 24.

The "Catalogus" places the species in Longitarsus, probably from the comparison made by Olivier, but this is certainly not correct. I have suspected that it might possibly be either *Œdionychis texana* or *subvittata*.

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BLEPHARIDA Rogers.

B. **rhois** Forst., Nov. Spec. Ins. 1771, p. 21; Hübner, Naturf. xxi, p. 40, pl. 2, fig. 3; Rogers, Proc. Acad. 1856, p. 29; Riley (larva), Sixth Missouri Rep. 1874, p. 118.
stolida Fab., Syst. Ent. p. 95; Oliv. Ent. v, p. 526, pl. 2, fig. 24 *a–b*; Suff. Stett. Zeit. 1858, p. 241.
virginica Fröhl., Naturf. xxvi, 1792, p. 129.
meticulosa Oliv., Ent. v, p. 531, pl. 6, fig. 91.

PACHYONYCHUS Chev.

P. **paradoxus** Mels., Proc. Acad. iii, p. 163; Crotch, Proc. Acad. 1873, p. 58 (not *Pachyonychis paradoxa* Clark).

PHÆDROMUS Clark.

P. **Waterhousei** Clark, Catal. B. M. Halticidæ, p. 66, pl. iii, fig. 1

HYPOLAMPSIS Clark.

H. **pilosa** Illiger, Mag. vi, p. 105; Clark, Cat. Halt. 1860, p. 229.
rugosa Oliv., Ent. vi, p. 707, pl. 4, fig. 71.
hispida Zieg., Proc. Acad. 1846, p. 47.
Clarki Crotch, Proc. Acad. 1873, p. 57.

H. **Mellyi** Crotch, Proc. Acad. 1873, p. 58.

PSEUDOLAMPSIS n. g.

P. **guttata** Lec., Trans. Am. Ent. Soc. xii, 1884, p. 29.

HAMLETIA Crotch.

H. **dimidiaticornis** Cr., Proc. Acad. 1853, p. 58.
paradoxa Clark (*Pachyonychis*), Halt. B. M. p. 67, pl. 2, fig. 7.

ŒDIONYCHIS Latr.

1. Œ. **gibbitarsa** Say, Journ. Acad. 1824, p. 83; edit. Lec. ii, p. 225.
2. Œ. **flavocyanea** Crotch, Proc. Acad. 1873, p. 62.
3. Œ. **thoracica** Fab., Syst. Ent. App. 821; Oliv., Ent. vi, p. 678, pl. 1, fig. 16.
flava Gmel. Edit. Linn. i, 4, p. 1691.
4. Œ. **vians** Illig., Mag. vi, p. 83.
abdominalis Oliv., Ent. vi, p. 679, pl. 1, fig. 17.
scripticollis Say, Journ. Acad. 1824, p. 84; edit. Lec. ii, p. 226; Lec., Proc. Acad. 1860, p. 321.
thoracica var. Clark, Journ. Ent. ii, p. 166.

5. Œ. concinna Fab., Syst. El. i, p. 499; Oliv., Ent. vi, p. 679, pl. 1, fig. 18.
6. Œ. violascens Lec., Proc. Acad. 1859, p. 81.
7. Œ. lugens Lec., Col. Kans. 1859, p. 24.
8. Œ. interjectionis Crotch, Proc. Acad. 1873, p. 61; Harold, Berl. Zeit. 1881, p. 129.
gracilis Jacoby, Biol. Cent. Am. vi, 1, p. 420, pl. xxiv, fig. 14.
9. Œ. fimbriata Forst., Nov. Spec. Ins. i, 1771, p. 25.
suturella Say, Journ. Acad. v, p. 300; edit. Lec. ii, p. 344.
circumcincta Crotch, P. Acad. 1873, p. 62; Harold, Berl. Zeits. 1881, p. 151.
10. Œ. æmula n. sp.
11. Œ. petaurista Fab., Syst. El. i, p. 495; Oliv., Ent. vi, p. 674, pl. 2, fig. 7; Harold, Berl. Zeit. 1881, p. 150.
var. *brevilineata* Horn, supra.
12. Œ. tenuilineata n. sp.
13. Œ. miniata Fab., Syst. El. i, p. 495; Oliv., Ent. vi, p. 685, pl. 2, fig. 29
fallax Mels., Proc. Acad. iii, p. 162.
jocosa Harold, Col. Heft. xv, p. 124; Berl. Zeit. 1881, p. 141.
14. Œ. Horni Harold, Berl. Zeit. 1881, p. 142.
15. Œ. Ulkei n. sp.
16. Œ. longula Harold, Deutsche Zeit. 1877, p. 434; Berl. Zeit. 1881, p. 141.
17. Œ. Jacobiana n. sp.
18. Œ. flavida n. sp.
19. Œ. indigoptera Lec.
20. Œ. texana Crotch, Proc. Acad. 1873, p. 63.
21. Œ. thyamoides Crotch, Proc. Acad. 1873, p. 63.
22. Œ. limbalis Mels., Proc. Acad. iii, p. 162.
23. Œ. sexmaculata Illiger, Mag. vi, p. 104.
palliata Rand., Bost. Journ. ii, p. 47.
24. Œ. suturalis Fab., Syst. El. i, p. 499; Oliv., Ent. vi, p. 692, pl. 3, fig. 42.
25. Œ. quercata Fab., Syst. El. i, p. 495; Oliv., Ent. vi, p. 687, pl. 2, fig. 32.
obsidiana Fab., loc. cit. p. 499; Oliv., loc. cit. p. 691, pl. 2, fig. 40.
circumdata Rand., Bost. Journ. ii, p. 48.
26. Œ. scalaris Mels., Proc. Acad. iii, p. 163.
lobata Lec., Col. Kans. 1859, p. 24.

HOMOPHŒTA Chevr.

Asphæra Chev.

H. æquinoctialis Linn., Syst. Nat. ed. x, p. 374.
quadrinotata Fab., Oliv. Ent. vi, p. 682, p. 2, fig. 23.
octomaculata Crotch, Proc. Acad. 1873, p. 60.
H. lustrans Crotch, Proc. Acad. 1873, p. 60.
H. abdominalis Chev., Col. Mex. Cent. 1, No. 65.
opacior Crotch, Proc. Acad. 1873, p. 60.

PHYDANIS n. g.

P. bicolor n. sp.

DISONYCHA Chev.

D. pensylvanica Illig., Mag. vi, p. 146.
var. *limbicollis* Lec., Pacif. R. R. Rep. 1857, p. 67.
var. *pensylvanica* Illig. loc. cit.
uniguttata Say, Journ. Acad. 1824, p. 88; edit. Lec. ii, p. 229.
vicina Kby., Fauna Am. Bor. iv, p. 217.
procera Casey, Contributions, p. 182.

var. *pallipes* Crotch, Proc. Acad. 1873, p. 64.
var. *conjugata* Fab., Syst. El. i, p. 495; Oliv., Ent. vi, p. 686, pl. 2, fig. 30.
D. **quinquevittata** Say, Journ. Acad. 1824, p. 85; edit. Lec. ii, p. 227.
puncticollis Lec., Pacif. R R. Rep. 1857, Ins. p. 67.
fumata Lec., Proc. Acad. 1858, p. 86.
pluriligata Lec., Journ. Acad. 1858, p. 27; Col. Kans. 1859, p. 25.
punctigera Lec., Col. Kans. 1859, p. 24.
capitata Jacoby, Biol. Cent Am. vi, pt. 1, p. 316.
var. *pura* Lec., Proc. Acad. 1858, p. 86.
D. **crenicollis** Say, Bost. Journ. 1835, p. 200; edit. Lec. ii, p. 668.
D. **caroliniana** Fab., Syst. Ent. 1775, p. 122; Oliv., Ent. vi, p. 684, pl. 2, fig. 27.
quinquevittata Fab., Syst. Ent. p. 118.
alternata Illig., Mag. vi, p. 144.
pulchra Casey, Contributions, p. 51.
D. **arizonæ** Casey, Contributions, p. 52.
D. **glabrata** Fab., Spec. Ins. i, p. 156; Illig., Mag. vi, p. 144; Oliv., Ent. vi. 685, pl. 2, fig. 28.
D. **maritima** Mann., Bull. Mosc. 1843, ii, p. 311.
D. **abbreviata** Mels., Proc. Acad. iii, p. 163.
D. **tenuicornis** n. sp.
D. **discoidea** Fab., Ent. Syst. i, 2, p. 25; Illig. Mag. vi, p. 143.
D. **funerea** Randall, Bost. Journ. ii, p. 47.
D. **triangularis** Say, Journ. Acad. 1824, p. 84; edit. Lec. ii, p. 226.
puncticollis Kby., Fauna Bor. Am. iv, p. 218, pl. 7, fig. 9.
D. **xanthomelæna** Dalm., Analecta Ent 1823, p. 79.
collaris ‡ Illig. Mag. vi, p. 126.
D. **politula** n. sp.
D. **cervicalis** Lec., Col. Kans. 1859, p. 25.
D. **mellicollis** Say, Bost. Journ. i, p. 199; edit. Lec. ii, p. 668.
semicarbonata Lec., Col. Kans. 1859, p. 25.
D. **collata** Fab., Syst. El. i, p. 463; Oliv., Ent. vi, p. 702, pl. 4, fig. 61.

HEMIPHRYNUS n. g.

H. **intermedius** Jacoby, Biol. Cent. Am. vi, pt. 1, p. 293.

ARGOPISTES Motsch.

A. **scyrtoides** Lec., Proc. Am. Philos. Soc. 1878, p. 416.

SPHÆRODERMA Steph.

S. **opima** Lec., Proc. Am. Philos. Soc. 1878, p. 417.

HALTICA Geoffr.

H. **bimarginata** Say, Journ. Acad. 1824, p. 85; edit. Lec. ii, p. 226.
plicipennis Mann., Bull. Mosc. 1843, ii, p. 310.
prasina Lec., Pacif. R. R. Rep. Ins. 1857, p. 67.
ambiens, subplicata Lec., Col. Kans. p. 25.
H. **chalybea** Illiger, Mag. vi, p. 115.
vitivora Thomas, Sillim. Journ. 1834, p. 113.
H. **nana** Crotch, Proc. Acad. 1873, p. 72.
nanula Lec., Trans. Am. Ent. Soc 1884, p. 29.
H. **ignita** Illiger, Mag. vi, p. 117.
kalmiæ Mels., Proc. Acad. 1847, p. 164.
inærata Lec., Proc. Acad. 1860, p. 317.
H. **vicaria** n. sp.

H. carinata Germ., Ins. Spec. Nov. 1824, p. 610.
exapta Say, Ins. Louisiana, 1832, p. 6; edit. Lec. i, p. 302.
torquata Lec., Journ. Acad. 1858, p. 27; Col. Kans. p. 26.
H. californica Mann., Bull. Mosc. 1843, ii, p. 310.
H. obliterata Lec., Col. Kans. 1859, p. 26.
H. evicta Lec., Proc. Acad. 1859, p. 286.
H. æruginosa Lec., Proc. Acad. 1859, p. 286.
H. obolina Lec., Pacif. R. R. Rep. 1857, p. 67.
H. amœna n. sp.
H. marevagans n. sp.
H. tombacina Mann., Bull. Mosc. 1853. iii, p. 259.
cupreola Lec. *MSS.*
H. tincta Lec., Proc. Acad. 1859. p. 286.
H. punctipennis Lec., Col. Kans. 1859, p. 25.
H. lazulina Lec., Pacif. R. R. Rep. 1857, p. 67.
H. foliacea Lec., Proc. Acad. 1858, p. 86.
H. polita Oliv., Ent. vi, p. 706, pl. 4, fig. 68.
H. fuscoænea Mels., Proc. Acad. 1847, p. 165.
H. opulenta n. sp.
H. floridana n. sp.
H. Burgessi Crotch, Proc. Acad. 1873, p. 71.
H. rufa Illiger, Mag. vi, p. 153.
scutellaris Oliv., Ent. vi, 699, p. 3, fig. 56; Harold, Heft. xiv, p. 20; Jacoby (*Lactica*), Biol. Cent. Am. vol. vi, pt. 1, p. 273, pl. 16, fig. 6.

LACTICA Erichs.

L. tibialis Oliv., Ent. vi, p. 697, pl. 3, fig. 52.
ocreata Say, Ins. Louis. 1832, p. 7; edit. Lec. i, p. 303.
xanthochroa Harold, Heft. xiii, 1875, p. 89.
L. Iris Oliv. Ent. vi, p 702, pl. iv, fig. 62.
specularis Harold, Col. Heft. xiii, p. 89; xiv, p. 17.

DIPHAULACA Clark.

D. bicolorata n. sp.

TRICHALTICA Harold.

T. scabricula Crotch, Proc. Acad. 1873, p. 71; Harold, Heft. xv, 1876, p. 2.

HEMIGLYPTUS n. g.

H. basalis Crotch, Trans. Am. Ent. Soc. 1874, p. 80.

ORTHALTICA Crotch.

O. copalina Fab., Syst. El. p. 466; Oliv., Ent. vi, p. 720, pl. 5, fig. 92.
forticornis Illig., Mag. vi, p. 111.
O. melina n. sp.

CREPIDODERA Chev.

C. rufipes Linn., Syst. Nat. ed. x, p. 373.
erythropus Mels., Proc. Acad. iii, p 165.
C. longula n. sp.
C. Helxines Linn., loc. cit. p. 373.
nana Say, Journ. Acad. iv, p. 86.
violacea Mels., Proc. Acad. iii, p. 164.
areola Lec., Pacif. R. R. Rep. 1857, p. 68.
opulenta Lec., Proc. Acad. 1858, p. 86.
C. robusta Lec, Proc. Bost. Soc. N. H. 1874, p. 274.
C. Modeeri Linn., Faun. Suec. 1761, p. 167; Oliv., Ent. vi, p. 724, pl. 5, fig. 98.
mancula Lec., Proc. Acad. 1861, p. 358.

C. atriventris Mels., Proc. Acad. iii, p. 165.
C. nitens n. sp.

EPITRIX Foudras.

E. fuscula Crotch, Proc. Acad. 1873, p. 72.
E. lobata Crotch, loc. cit.
E. cucumeris Harris, Journ. Agric. 1851, p. 103.
pubescens (pars) Illig., Mag. vi, p. 58.
seminulum Lec., Proc. Acad. 1861, p. 358.
E. brevis Schwarz, Proc. Am. Philos. Soc. 1878, p. 367.
E. subcrinita Lec., Pacific R. R. Rep. 1857, p. 68.
E. parvula Fab., Syst. El. i, p. 468.
hirtipennis Mels., Proc. Acad. iii, p. 165.

LEPTOTRIX n. g.

L. recticollis Lec., Proc. Acad. 1861, p. 358.

MANTURA Steph.

M. floridana Crotch, Proc. Acad. 1873, p. 73.

EUPLECTROSCELIS Crotch.

E. Xanti Crotch, Proc. Acad. 1873, p. 75.

CHÆTOCNEMA Steph.

C. perturbata n. sp.
C. cribrata Lec., Proc. Am. Philos. Soc. 1878, p. 419.
C. irregularis Lec., Pacific R. R. Rep. 1857, p. 69.
rudis Lec., Proc. Am. Philos. Soc. 1878, p. 615.
C. subcylindrica Lec., Proc. Am. Phil. Soc. 1878, p. 419; *cylindrica* || l. c. p. 417.
C. protensa Lec., Proc. Am. Philos. Soc. 1878, p. 417.
C. brunnescens n. sp.
C. denticulata Illig., Mag. vi, 163.
semichalcea Mels., Proc. Acad. iii, p. 167.
americana Mots., Schrenks Reise, ii, p. 235.
texana Crotch, Proc. Acad. 1873, p. 74.
C. cribrifrons Lec., Bull. U. S. Geol. Surv. 1879, v, p. 517.
C. pinguis Lec., Proc. Am. Philos. Soc. 1878, p. 417.
C. æmula n. sp.
C. opacula Lec., Proc. Am. Philos. Soc. 1878, p. 418.
C. minuta Mels., Proc. Acad. iii, p. 167.
C. alutacea Crotch, Proc. Acad. 1873, p. 74.
C. subviridis Lec., Col. Kans. 1859, p. 27.
C. opulenta n. sp.
C. obesula Lec., Proc. Am. Philos. Soc. 1878, p. 418.
C. ectypa n. sp.
C. parcepunctata Crotch, Proc. Acad. 1873, p. 74.
paupercula Casey, Contrib. i, p. 53.
C. pulicaria Mels., Proc. Acad. iii, p. 167.
æneola Lec., Bull. U. S. Geol. Surv. 1879, v, p. 518.
C. crenulata Crotch, Proc. Acad. 1873, p. 74; Schwarz, Proc. Am. Philos. Soc. 1878, p. 368.
C. confinis Crotch, Proc. Acad. 1873, p. 75.
flavicornis Lec., Proc. Am. Philos. Soc. 1878, p. 418.
C. elongatula Crotch, Proc. Acad. 1873, p. 75.
C. dispar n. sp.
C. quadricollis Schwarz, Proc. Am. Philos. Soc. 1878, p. 368.
C. decipiens Lec., Proc. Am. Philos. Soc. 1878, p. 418.

SYSTENA Clark.

S. hudsonias Forst., Nov. Spec. Ins. 1771, p. 26.
frontalis Illig., Mag. vi, p. 155, pars.
S. frontalis Fab., Syst. El. i, p. 300; Oliv., Ent. vi, p. 694. pl. 3, fig. 46.
S. collaris Crotch, Proc. Acad. 1873, p. 68.
S. senilis Say, Journ. Acad. iv, p. 87; edit. Lec., ii, p. 228; Crotch, Proc. Acad. 1873, p. 70.
S. subænea Lec., Pacific R. R. Rep. 1857, p. 68.
S. pallipes Schwarz, Proc. Am. Philos. Soc. 1878, p. 367.
S. elongata Fab., Ent. Syst. Supp. p. 99; Oliv., Ent. vi, p. 694, pl. 3, fig. 45.
S. tæniata Say, Long's Second Exped. p. 294; edit. Lec. i, p. 195.
blanda, Mels., Proc. Acad. iii, p. 164.
ligata Lec., Pacific R. R. Rep. 1857, p. 68.
ochracea Lec., Proc. Acad. 1858, p. 87.
mitis Lec., Proc. Acad. 1858, p. 87.
bitæniata Lec., Col. Kans. 1859, p. 36.
pallidula Boh., Eugen. Resa, p. 192.
S. marginalis Illig., Mag. vi, p. 150.
oblonga Lec., Ann. Lyc. i, p. 173.

GLYPTINA Lec.

G. bicolor n. sp.
G. cyanipennis Crotch, Proc. Acad. 1873, p. 65.
G. nivalis n. sp.
G. brunnea n. sp.
G. spuria Lec., Col. Kans. p. 26.
lissotorques Lec., loc. cit. p. 27.
G. cerina Lec., Pacific R. R. Rep. 1857, p. 68.
G. atriventris n. sp.

APHTHONA Foudras.

A. texana Crotch, Proc. Acad. 1873, p. 67.
A. socia n. sp.
A. insolita Mels., Proc. Acad. iii, p. 168; Crotch (*Ceratattica*), Proc. Acad. 1873, p. 73.
A. subglobosa Motsch., Bull. Mosc. 1845, iv, p. 381. pl. 7, fig. 7 (unknown).

PHYLLOTRETA Foudras.

Series A.

P. lepidula Lec., Pacific R. R. Rep. 1857, p. 68.
P. sinuata Stephens, Illust. Brit. Ent iv, p. 297.
Zimmermanni Crotch, Proc. Acad. 1873, p. 66.
P. vittata Fab., Syst. El. i, p. 469
striolata Fab., Illig., Mag. ii, p. 293; vi, p. 148.
P. oregonensis Crotch, Proc. Acad. 1873, p. 66.
P. robusta Lec., Proc. Am. Philos. Soc. 1878, p. 614.
P. denticornis n. sp.
P. Ulkei n. sp.
P. decipiens n. sp.
P. albionica Lec., Pacific R. R. Rep. 1857, p. 68.

Series B.

P. ramosa Crotch, Trans. Am. Ent. Soc. 1874, p. 80.
P. bipustulata Fab., Syst. El. i, p. 464; Oliv., vi, p. 723, pl. 5, fig. 97.

P. **chalybeipennis** Crotch, Proc. Acad. 1873, p. 67.
P. **æneicollis** Crotch, loc. cit.
P. **Lewisii** Crotch, loc. cit. p. 66.
P. **pusilla** n. sp.
P. **picta** Say, Journ. Acad. iv, p. 87; edit. Lec., ii, p. 228.

LONGITARSUS Latr.

L. **Heliophyti** n. sp.
L. **subrufus** Lec., Col. Kans. 1859, p. 26.
L. **turbatus** n. sp.
L. **oregonensis** n. sp.
L. **traductus** n. sp.
L. **postremus** n. sp.
L. **repandus** Lec., Proc. Acad. 1858, p. 87.
L. **livens** Lec., Proc. Acad. 1858, p. 87.
L. **vanus** n. sp.
L. **occidentalis** n. sp.
L. **bicolor** n. sp.
L. **alternatus** Ziegler, Proc. Acad. 1846, p. 271.
rubicunda Mels., Proc. Acad. 1847, p. 166.
rubidus Lec., Col. Kans. 1859, p. 26.
L. **montivagus** n. sp.
L. **erro** n. sp.
L. **pygmæus** n. sp.
L. **testaceus** Mels., Proc. Acad. iii, p. 166; Lec., Proc. Acad. 1858, p. 87.
L. **melanurus** Mels, Proc. Acad. iii, p. 166.
L. **rufescens** n. sp.
L. **insolens** n. sp.
L. **perforatus** n. sp.
L. **solidaginis** n. sp.
L. **nitidellus** Cockerell, First Rep. Colorado Biol. Assoc. 1888, p. 4.
L. **mancus** Lec., Proc. Acad. 1858, p. 87.
apterus Lec., loc. cit.
L. **californicus** Motsch., Bull. Mosc. 1845, iv, p. 382 (unknown).

DIBOLIA Latr.

D. **sinuata** n. sp.
D. **borealis** Chev., Guér. Icon. Règne Anim. 1845, p. 307, pl. 49 bis, fig. 12: Jacoby, Biol. Cent. Am. vi, pt. 1, p. 357, pl. xxi, fig. 10.
ærea Mels., Proc. Acad. iii, p. 167.
D. **ovata** Lec., Proc. Acad. 1859, p. 286.
D. **libonoti** n. sp.

PSYLLIODES Latr.

P. **punctulata** Mels., Proc. Acad. iii, p. 166.
parvicollis Lec., Pacific R. R. Rep. 1857, p. 69.
extricata ♂ Casey, Contributions 1884, p. 54.
æneseens Casey, loc. cit. p. 55.
P. **convexior** Lec., Pacific R. R. Rep. 1857, p. 69.
interstitialis Lec., Proc. Acad. 1858, p. 67.
P. **elegans** n. sp.
P. **sublævis** n. sp.

EXPLANATION OF PLATE V.

Figs. 1–5.—Œdionychis petaurista *Fab.* and its variations; fig. 5 may be *longula* Harold.
Fig. 6.—Œdionychis interjectionis *Crotch.*
" 7.— " æmula *Horn.*
" 8.— " fimbriata *Forst.* (typical)
Figs. 9–12.— " texana *Crotch* and varieties.
Fig. 13.— " miniata *Fab.*
" 14.— " tenuilineata *Horn.*
" 15.— " Ulkei *Horn.*
" 16.— " Jacobiana *Horn.*
Figs. 17–20.— " scalaris *Mels.* and its varieties.

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EXPLANATION OF PLATE VI.

Fig. 1.—Œdionychis quercata var. *obsidiana* Fab.
" 2.— " quercata *Fab.*
" 3.— " sexmaculata *Illig.*
" 4.— " quercata var.
" 5.— " suturalis *Fab.*
" 6.— " suturalis var.
" 7.— " limbalis *Mels.* var. *subvittata* Horn.
" 8.— " thyamoides *Crotch.*
" 9.—Hamletia dimidiaticornis *Crotch.*
" 10.—Phydanis bicolor *Horn.*
" 11.—Leptotrix recticollis *Lec.*
" 12.—Phyllotreta ramosa *Crotch.*
" 13.— " bipustulata *Fab.*
" 14.— " vittata *Fab.* and ♂ antenna.
" 15.— " sinuata *Steph.* and ♂ antenna.
" 16.— " oregonensis *Crotch* and ♂ antenna.
" 17.— " lepidula *Lec.* and ♂ antenna.
" 18.— " robusta *Lec.* and ♂ antenna.
" 19.—Antenna ♂ of P. denticornis *Horn.*
" 20.—Antenna ♀ of species of Series A.
" 21.—Antenna ♂ and ♀ of species of Series B.
" 22.—Antenna ♂ of P. albionica *Lec.*
" 23.—Antenna ♂ of P. Ulkei *Horn.*
" 24.—Altica liturata *Oliv.*, enlarged after Olivier (unknown).

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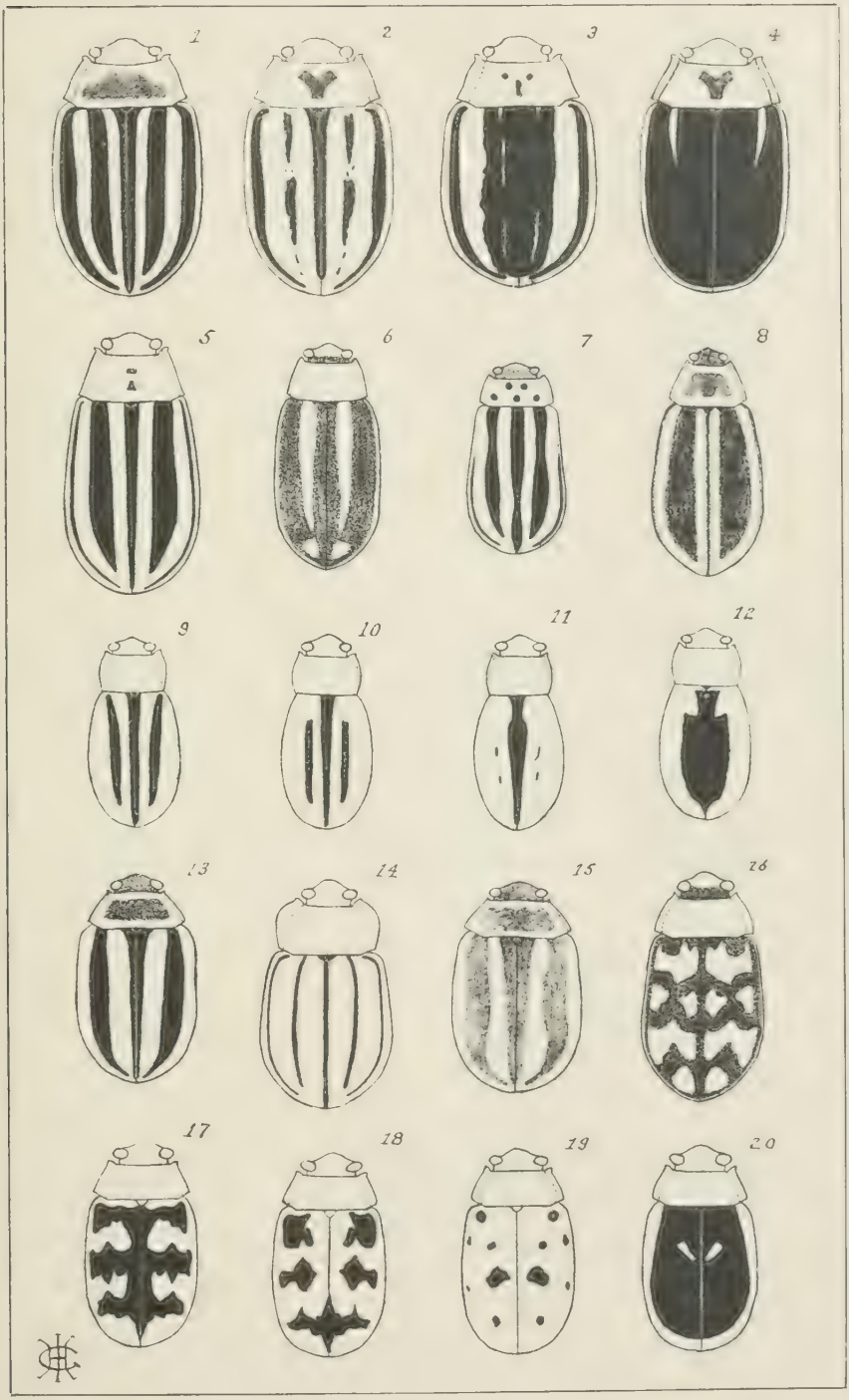
EXPLANATION OF PLATE VII.

Fig. 1.—Pachyonychus paradoxus *Mels.*
" 2.—Hemiglyptus basalis *Crotch.*
" 3.—Euplectroscelis Xanti *Crotch.*
" 4.—Argopistes scyrtoides *Lec.*
Figs. 5–8.—Systena tæniata *Say.*
Fig. 9.—Posterior tibia of Chætocnema, seen from beneath.
" 10.— " " Sphæroderma.
" 11.— " " Œdionychis.
" 12.— " " Homophœta (*Asphæra*).
" 13.— " " Psylliodes.
" 14.— " " Longitarsus.
" 15.— " " Argopistes.
" 16.— " " Disonycha.
" 17.— " " Dibolia.
" 18.—Antenna and claws of Blepharida.
" 19.—Antenna ♂ Aphthona socia.
" 20.—Elytra of Œd. limbalis *Mels.* from a specimen in the LeConte cabinet, intermediate between the subvittate form (Pl. VI, fig. 7) and the typical, which resembles fig. 2, Pl. VI.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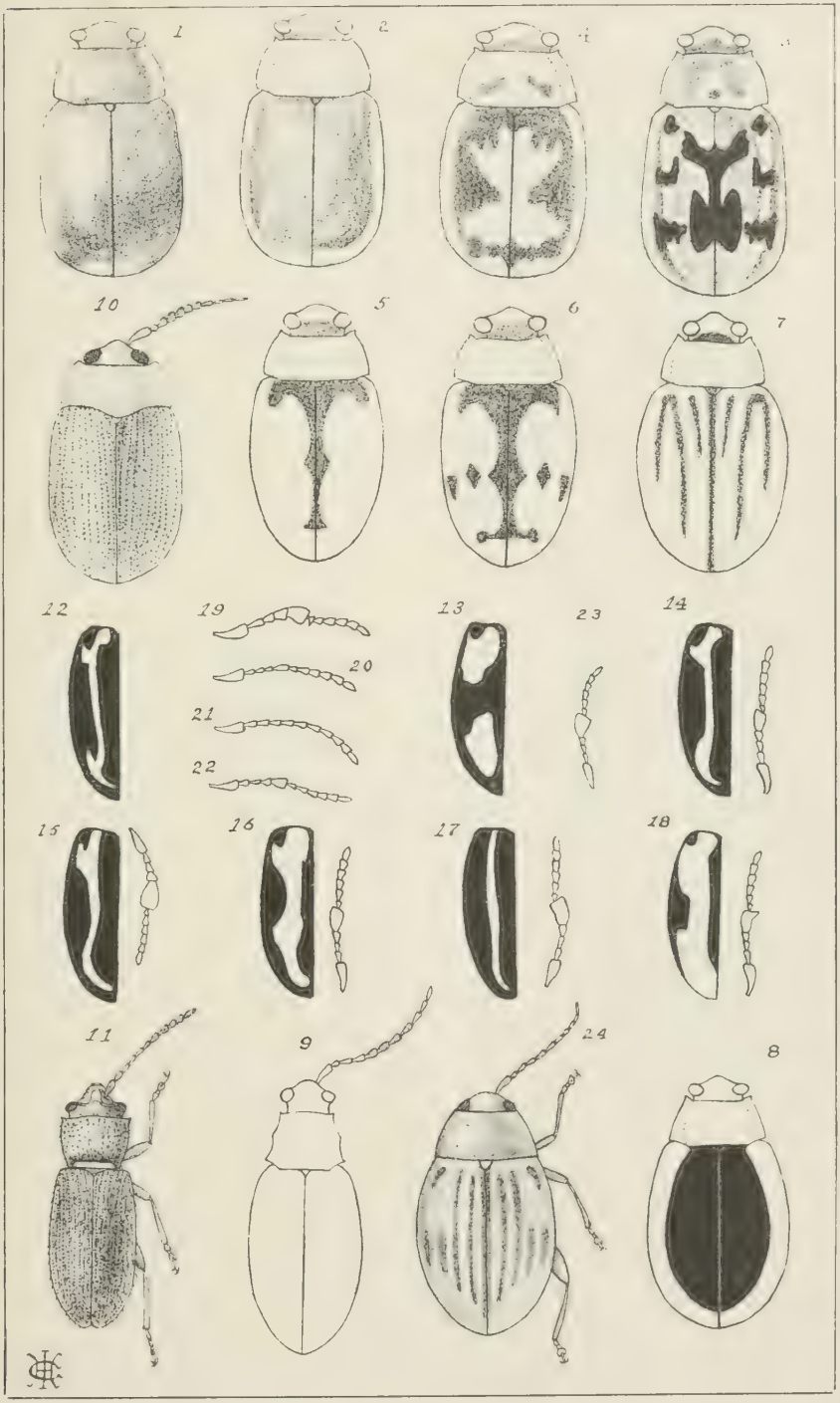
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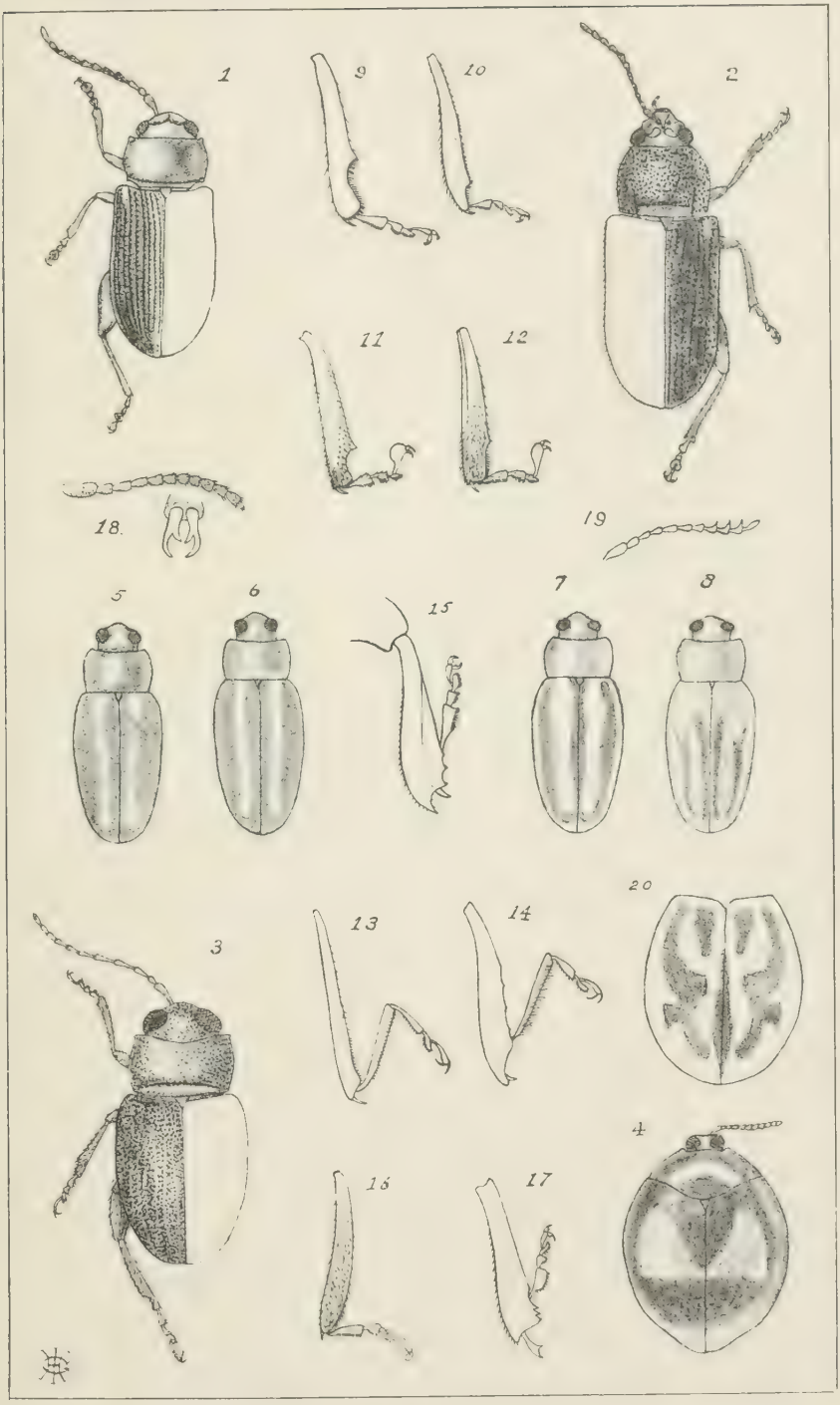
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Contributions toward a Monograph of the NOCTUIDÆ of Temperate North America.*

Revision of the species of Oncocnemis.

BY JOHN B. SMITH.

ONCOCNEMIS Lederer.

Noct. Eur. 94, 1857.

A free translation of Lederer's characterization of the genus is as follows:

Moderate in size, wing form of *Cladocera*, but more slender, vestiture smoother.

Collar and thorax rounded, vestiture close, hairy, with an admixture of flattened scales, without tuftings. Front not produced, vestiture short. Palpi ascending, very slightly exceeding the vertex, the vestiture somewhat divergent, terminal joint short, obtuse, horizontal. Eyes naked, lashed. Tongue spiral; antennæ filiform, in the males of § A lengthily, in those of § B very shortly ciliate. Breast and femora with fine, thin, vestiture; tibiæ closely scaled or with rather sparse divergent vestiture, the anterior short, with a stout claw at tip. Abdomen closely scaled, in the female obtusely pointed with a very short, usually somewhat exserted ovipositor; harpes of male slender, somewhat curved, the upper end of tip rather acute, the lower rounded.

Primaries moderately widening outwardly, the apex and anal angle somewhat rounded; ash-gray, iron-gray, or reddish luteous, with the ordinary Noctuid maculation, which is, however, rather delicate and sometimes confused. Ordinary spots small. Fringes entire, unicolorous, like the surface of wings, somewhat glistening Secondaries light ashen gray, or yellowish gray, with somewhat diffused darker margin, which on the underside is limited by a narrow line and therefore seems better marked.

* For introductory remarks to this series of papers see Ent. Amer. v, 105, June, 1889.

The imagos fly in the Ural and Altai regions in the evening at flowers.

There are but four European species, and the genus there seems a compact one. To include our species the definition will have to be somewhat extended, since there are numerous species showing several different types of maculation and considerable difference in habitus. Essentially the structural portion of the definition applies well enough to our species. In some, however, the eyes are not very distinctly lashed, and in a very fair proportion there is a distinct, though never prominent posterior tuft to the thorax. There is some little difference in wing form as well, making the genus a somewhat loose assemblage, or a series of poorly limited groups which are themselves rather compact.

The essential characters are the armed fore tibia, lack of other tibial armature, the more or less evidently lashed eyes, unmodified front and rather smooth vestiture.

The genitalia of the males, so far as they have been studied, are of the same type. To Lederer's characters, which in general apply to our own species as well, may be added that from the lower margin of the harpe, and about its middle arises a corneous clasper somewhat variable in length and form, but rarely much curved and very rarely reaching beyond the upper margin of the harpe.

The first series of species, which in structure and habitus perhaps is nearest to the European, is readily distinguished by yellow secondaries, the margin broadly black. Three species are referable here. The second has the secondaries banded, white and black, and is readily recognizable by that character alone. The species are somewhat broader winged than usual. The other species have the secondaries white or fuscous, with a more or less definite outer dark margin, variable also in width.

Separated very distinctly from the others is *atrifasciata*, which is unique by the broad, black, contrasting, median space of primaries. The secondaries are black, white basally, black beyond the middle. It is more robust in appearance than the preceding, the collar is somewhat marked medially and the thoracic tufting is evident. The genus *Metahadena* was created by Mr. Morrison for this species, but Mr. Grote properly suppressed it.

The remaining species form two distinct series—in the one the normal maculation is present—in the other the median lines are lost,

the claviform becomes a prominent feature and the ordinary spots are sometimes confluent, the orbicular becoming long and narrow.

In the first series the species are not very easily separable into definite groups, though they afford some differences.

Terminalis differs from all here in the small markings, the broad dark terminal shade of primaries and the broad black margin of secondaries.

In some of the species of which *levis* and *augustus* afford good illustrations, the fringes are unusually long, the maculation is distinct, the median lines more or less evidently geminate, the outer darker border of secondaries somewhat defined. The species are gray, with a more or less distinct luteous shading.

In the remaining species of this first series it is difficult to form groups without raising each species to that rank. There are scarcely two, and certainly no more than two species that agree very closely in any but the generic characters, and the species *homogena* may be, therefore, very appropriately selected to typify the group. The only species perhaps separable with any justice is *saundersiana*, which is unique by the very even and very distinctly geminate median lines.

Of the second series, in which the median lines are lost, the orbicular is elongate and the spots often fused, three groups are readily marked.

Group *Chandleri* contains those species in which the s. t. line is preceded by a series of sagittate black spots set in a whitish areole.

Group *Cibalis* contains two species which are distinguished by a very evident, even, broad, dark shade preceding the s. t. line, and the primaries are also somewhat more produced apically, while the body appears slighter.

Finally, *atricollaris* is typical of a group in which there is a black streak from the reniform outward at least (*griseicollis*), or extending through the centre of the wing from base to outer margin.

In tabular form the series are distinguishable as follows:

1.—Secondaries yellow ..... Group HAYESI.
2.—Secondaries black banded ..... Group FASCIATA.
3.—Secondaries white or fuscous ..... 4.
4.—Median lines distinct or readily traceable ..... 5.
Median lines lost, maculation longitudinally confused ..... 9.
5.—Median space of primaries discolorous, black ..... Group ATRIFASCIATA.
Median space concolorous ..... 6.

6.—Fringes unusually long, dark outer border of secondaries defined.....7.
Fringes normal; dark outer border of secondaries indefinite .....8.
7.—Terminal region of primaries darker, the lines narrow, ordinary spots small.
Group TERMINALIS.
Terminal region of primaries not darker; maculation normal.
Group LEVIS.
8.—Maculation and color diverse; contains all species not definitely referable elsewhere.....Group HOMOGENA.
9.—S. t. line preceded by a series of black, sagittate dashes set in a pale areole.
Group CHANDLERI.
S. t. line preceded by an even dark shade; no dashes.....Group CIBALIS.
Primaries with a longitudinal black shade from base or from reniform to outer margin.....Group ATRICOLLARIS.

Oncocnemis aterrima Grote is an Heliothid allied to *Melicleptria*.

Group HAYESI.

Secondaries with base yellow, outer margin broadly black.

Three species are referable to this group, very similar in appearance at first sight, and yet abundantly distinct and easily separable. The yellow secondaries of course form the most striking characteristic, but the resemblance otherwise is close, the genitalia of the male being often the same in pattern though differing in detail.

Hayesi differs at once from all the others by lacking the claviform. The ground color is dull luteous brown, paler than either of the other species, the transverse lines distinct, the t. p. line outwardly denticulate on the veins, s. t. line preceded by a distinct dusky shade.

Dayi has the claviform distinct, the transverse lines easily traceable, t. p. line even. The ordinary spots are well defined, moderate in size, the orbicular round, the reniform with a pale shade beyond to the t. p. line, which is characteristic. On the underside the terminal space of primaries is whitish or pale powdered—a peculiarity of this species, the black band on the other species extending to the margin.

Mirificalis is usually a trifle smaller than the other species. The claviform is distinct, a black line connecting it with base. The t. a. line is marked only on costa. The orbicular, unlike the other species, is elongate, oval, not round; the reniform is small, narrow, neatly defined. The other characters will be given with the species.

In tabular form the differences are as follows:

Orbicular round; reniform large.
T. p. line single denticulate on veins; claviform wanting.....**hayesi.**
T. p. line geminate, even; claviform present.....**dayi.**
Orbicular elongate, oval; reniform small.....**mirificalis.**

O. hayesi Grt., Bull. Buff. Soc. N. Sci. i, 106, pl. 3, fig. 13, 1873.

Head thorax and primaries a dull luteous gray, powdery, markings of primaries fuscous brown. Basal line visible, faint, single; t. a. line single, outwardly oblique from costa, outwardly and roundedly exserted on the interspaces and sometimes dentate in the cell; t. p. line single, outwardly curved over the cell, somewhat incurved in the submedian interspace, outwardly dentate on the veins. Through the outer portion of the median space is a broad, distinct, upright, or only slightly curved transverse shade, which rarely becomes faint enough to cause a doubt as to its presence. The ordinary spots are large and rather vague; the orbicular round, faintly pale ringed with centre of ground color of primaries; the reniform is more indefinite, broad, also pale ringed and with concolorous centre; beyond the t. p. line the s. t. space is paler than ground color, the veins marked with fuscous, rapidly darkening near the s. t. line and forming a distinct dusky preceding shade; s. t. line powdery, irregularly dentate, nearly parallel to outer margin, paler, marked principally by the dark preceding shade; terminal space of ground color or a trifle darker; a narrow, more or less interrupted terminal line. Fringes concolorous with primaries, with a dusky line at base. Secondaries yellow, with a broad, black outer margin. Beneath pale straw yellow, with broad black outer margin on each wing; primaries paler. Abdomen rather clear luteous. Expands 1.12—1.25 inches; 28—32 mm.

Hab.—British Columbia, Colorado, Nevada Co., Cala. (Sept.).

The species is readily recognized by the superficial characters already pointed out. The genitalia of the ♂ are also distinctive. The harpes are elongate, the inferior margin rounded and oblique toward tip, where they are obliquely truncate. The clasper is corneous, from about the middle of inferior margin, dilated at middle, then narrowing rather suddenly to a long acute tip.

The species seems the least common of this group.

O. dayi Grt., Bull. Buff. Soc. N. Sci. i, 105, 3, fig. 8, 1873; Bull. U. S. Geol. and Geog. Surv. iii, 116.

Head, thorax and primaries mixed brown and gray, the shades rather sharply contrasted and not entirely constant. Primaries with basal line distinct, black, followed by a narrow pale line, more or less distinct according as the specimen is well or ill marked. Basal space else fuscous brown to the t. a. line. T. a. line not very distinct, geminate, the included space pale, very irregularly dentate and angulate, its general course outwardly oblique. The black edging to the t. a. line is fragmentary and partly on each side of the pale central space. T. p. line geminate, brown or black, the included space pale; very strongly exserted over the cell and there even; somewhat incurved in submedian interspace and there somewhat irregular. Between the ordinary spots the median space is darker, the broad shade thus inaugurated narrowing suddenly below vein 2. In bright specimens the inferior part of median space and the upper part to the orbicular is ashen gray, in dark specimens it is obscure fuscous brown and all intermediate shades occur. The claviform is distinct and usually pale, variable in size, as the median space is broader or narrower. Orbicular round, moderate in size, black ringed, followed by a pale ring, the centre brown or fuscous. Reniform moderate, normally shaped, distinct, with a narrow black margin, followed

by a broader pale ring, the centre red-brown or fuscous. Beyond the reniform to the t. p. line is a characteristic pale shade. The s. t. space darkens somewhat to the very irregular, powdery white s. t. line, which is preceded by a series of black, sagittate interspaceal dashes. Beyond the s. t. line the narrow terminal space is more or less powdery to the narrow blackish terminal line. Fringes long, pale, cut with fuscous, a fuscous line at base. Secondaries yellow, with a broad black outer margin. Beneath yellow, with broad black marginal band. Primaries paler, the extreme outer margin with white powderings. Head and thorax concolorous with primaries, head with crest between antennæ dusky; collar with a black and pale central line and pale tipped. The patagiæ are also more or less black powdered. Abdomen dull blackish gray. Expands 1.00—1.16 inches; 25—29 mm.

Hab.—Colorado.

The specimens vary quite considerably in brilliancy and details of maculation, the species still retaining its distinctive appearance however. Its peculiarities are elsewhere pointed out.

The genitalia of the male are well marked: the harpes are tolerably equal to near tip then obliquely rounded above, forming a rather acute angle inferiorly, the clasper corneous, stout at base, tapering rather suddenly to an acute point and inserted at lower margin rather close to tip.

The species seems not common.

O. mirificalis Grt., Bull. Surv. 5, 207.

Head, thorax and primaries dull fuscous brown. Primaries with basal line wanting. T. a. line marked only on costa, extending obliquely outward and not traceable below the median vein; a narrow, longitudinal black line from base to the narrow, loop-like claviform, which is defined by a narrow black line and a somewhat broader whitish interior ring; centrally it is concolorous with the primaries. The t. p. line is rather indistinct, single, broadly curved over the cell and incurved below the median vein. The orbicular is elongate oval, narrowly black ringed then with a broader white ring, the centre dusky. Reniform narrow, small, upright, neatly defined with black and white rings leaving a narrow, central, fuscous line. A broad black dash connects the two spots. Beyond the t. p. line and forming its outer margin is a rather broad, pale, or whitish shade, variably distinct, from which the s. t. space becomes darker to the very irregular, narrow whitish s. t. line. This line is preceded by a series of more or less distinct sagittate black dashes and followed by a more indistinct series of black dots, sometimes not easily visible in the dark terminal space. A dusky terminal line. Fringes fuscous, cut with darker brown, a pale line at base. Secondaries yellow, with a broad black outer margin. Beneath all wings yellow, with broad black outer margin. Collar with a black transverse line inferiorly. Abdomen yellowish fuscous. Expands 1—1.12 inches; 25—28 mm.

Hab.—Nevada, California (Nevada County, September).

Easily recognizable by the form of the ordinary spots.

The genitalia of the male are somewhat peculiar. The harpes are subequal, slightly curved, the tip truncate, the superior angle blunt. The corneous clasper arising rather beyond the middle from the thickened inferior margin is straight to near the tip, where it abruptly terminates in a very small, curved, acute corneous point, differing thus essentially from the other species in this section.

The species seems locally not uncommon.

Group FASCIATUS.

The salient feature of this group is found in the maculation of the secondaries which are fasciate, instead of merely with an indefinite outer band. Here the base is smoky, limited by a black band, beyond this a white band extends to the broadly black margin.

The two species referred to here are very different in appearance and in size. The typical species—*fasciatus*—is larger, heavier, dull fuscous gray in color, easily recognized by a white shade beyond the t. p. line, which, joining the central white band of secondaries in the spread insect, gives the appearance of a common white band.

Tenuifascia, as its name suggests, has the white band of secondaries very narrow. The species is much smaller, the wings comparatively shorter and broader than in the other species of the genus. Both species are based on single specimens, in each case a female. The discovery of the male and the form of the genitalia as compared with the other species will be interesting.

O. fasciatus Smith, Insect Life 1888, i, 18.

Head, thorax and primaries dull fuscous gray. Primaries with basal line single, distinct, black. Basal space to t. a. line paler, more ashen gray. T. a. line rather broad, single, black, outwardly oblique, making two large and not very prominent outward curves. T. p. line single, marked at costa, making a strong outward curve over reniform, then strongly incurved, interrupted by the white transverse band, again distinct below the reniform and with a slight inward curve to the inner margin. Claviform wanting. Orbicular rather small, round, narrowly outlined in black, somewhat paler than ground color. Reniform large, not very well defined, white, with a narrow fuscous crescent. Between reniform and t. p. line the ground color obtains and gives a deceptive appearance of the reniform in the broad white band. A narrow shade band crosses the outer part of median space, distinct and blackish on costa, less marked below. A broad, white, transverse shade over and including reniform, leaving a fuscous spot beyond reniform, limited inwardly by the t. p. line and almost extending to the s. t. line. S. t. line marked only by a series of sagittate black dashes shading off into the white band. Terminal space concolorous; a narrow terminal dark line. Fringes concolorous fuscous, narrowly cut with darker brown, a whitish

line at base. Secondaries dull smoky brown at base, outwardly limited by a black transverse band. Beyond this a broad white central band, the outer margin again broadly black. Fringes white, basally fuscous. Beneath both pairs of wings fuscous gray at base, outwardly limited by a black band; this followed by a broad white band and margins again broadly black. Head and thorax concolorous with basal space of primaries; abdomen a trifle paler. Exp. 1.10 inches; 27 mm.

Hab.—Nevada County, California (September).

A single ♀ in collection U. S. N. Mus. from Dept. of Agriculture.

The species is strongly marked and entirely unlike any other heretofore described. The common white transverse band is characteristic and renders the species readily recognizable. Its general appearance seems to refer it most nearly to the yellow underwings.

O. tenuifascia Smith, Insect Life, 1888, i, 18.

Head, thorax and primaries dull fuscous brown, the ordinary maculation of primaries distinct, though not prominent; blackish. Basal line present, black, with a narrow following pale line. T. a. line distinct, oblique, sinuate, black, preceded by an equally distinct pale line. Practically the line is geminate, the inner portion reduced to a few dark scales defining the intermediate pale shade. T. p. line distinct, geminate, inner line black, distinct, outer line punctiform, the intervening space white, the white line becoming broader toward the inner margin As a whole, the line curves outwardly over the reniform and is nearly straight below vein 2. Claviform distinct, black margined, concolorous. Orbicular small, round, black ringed, with an inner white annulus. Between the ordinary spots the cell is blackish, and from this point the narrow median shade runs parallel with and close to t. p. line to the hind margin. Reniform rather small, narrow, normal in shape, not very distinctly outlined, first black margined, then with a paler annulus, centre of ground color of primaries. S. t. line irregularly, but not strongly dentate, narrow, whitish, interrupted, preceded by a series of small black spots, a few white scales in s. t. space opposite cell and a rather large, indefinite pale spot filling the space near hind margin. A row of black terminal lunules. Fringes dusky, cut with darker fuscous and with a fuscous line at base. Secondaries smoky at base, limited by a sinuate black band, then a narrow white band followed by the broad black outer margin. Fringes white. Beneath both pairs of wings smoky at base, with a common black median band, followed by a broader white band, the outer margin broadly black. Expands .88 inches; 22 mm.

Hab.—Colorado.

A single female in Mr. Tepper's collection; the species is an easily recognizable one. Its small size and the banded secondaries are unusual. The primaries are somewhat broader and shorter than usual, and the body somewhat more robust; the eyes are not very distinctly lashed.

Despite its somewhat abnormal appearance I believe the species correctly referred here.

Group ATRIFASCIATA.

Only a single species constitutes this group, unique in the broad black median band of primaries. The secondaries are white basally, with a very broad black outer band. The essential characters have been already pointed out and the more particular description of the species is as follows:

O. atrifasciata Morr. Proc. Acad. Nat. Sci. Phil. 1875, 431, *Metahadena;* Grt., Can. Ent. 1878, x, 234, *Homohadena;* Bull. Bkln. Ent. Soc. 1880, iii, 38, *Homohadena.*

Head and thorax deep sooty brown or blackish. Primaries bluish gray, the median space deep, rich, very dark brown or blackish, forming thus a broad transverse band, somewhat variable in width. The basal space is powdered with deep brown, the basal half line visible as a very narrow brown line. T. a. line marked only as the inner margin of the median band, outwardly curved and somewhat oblique, varying in the specimens. T p. line similarly marked only as the outer margin of the median band, somewhat incurved from costa and again outwardly oblique below middle; the median shade thus broadest on costa, narrowest at middle, and again slightly broader at inner margin. The ordinary spots all wanting. The s. t. and terminal spaces are variably shaded and powdered with brown and the veins are more or less black marked; there is also a series of interspaceal narrow black lines. S. t. line diffuse, pale, marked by a preceding brown shade, which is broad and distinct on costa and narrows and becomes fainter toward the hind margin; the fringes are short, concolorous. Secondaries white basally, the margins and outer half blackish. Beneath, the primaries are smoky brown, the terminal space powdered with gray; secondaries as above. Expands 1.35—1.40 inches; 34—35 mm.

Hab.—Maine, New York (Adirondacks).

A very strongly marked species, at once recognizable by the distinct, blackish median space. The species is not rare where it occurs, but is not often taken. Mr. Hill took it in some numbers on fences in the Adirondacks and most of the specimens in collections are from him. The species is more plump and the vestiture somewhat heavier than in the typical forms, the collar with a distinct central ridge.

The genitalia are like those of the genus. The harpes have a roundedly oblique tip, inwardly fringed with spinules; the clasper arises as usual from the middle of inferior margin and abruptly narrows from the inner edge into a long, straight and acute spur, the whole extending about three-fourths across the harpe.

The species was made the type of the genus *Metahadena* Morr. Mr. Grote referred it to *Homohadena*, overlooking the distinct claw to fore tibia, strongly lashed eyes and other features which make it agree rather with this genus than with *Homohadena.*

Group TERMINALIS.

A single species also constitutes this group. It is peculiar in the maculation of primaries which have all the markings present, but fine, while there is a broad terminal shade through which the pale s. t. line is readily traceable. In appearance it is plump—allied to *atrifasciata* in that respect. The collar is also somewhat produced medially and the basal tuft is distinct; the species has no close allies in the genus and is isolated for that reason.

Further particulars will be given with the description of the species.

O. terminalis Smith, Insect Life, 1888, i, 19.

Head, thorax and primaries dull fusco-luteous, primaries with a broad blackish terminal shade. Basal line of primaries faintly indicated by a few black scales. T. a. line geminate, marked on costa by distinct black spots then becoming very faint, traceable principally by the paler inclosed space, and again becoming distinct below the internal vein; feebly dentate in its course; a blackish blotch preceding the line on internal margin. Orbicular small, round, pale ringed, centre concolorous. Reniform moderate in size, normal in shape, pale ringed, with a dusky lunule inwardly, else concolorous. Between these spots the median shade is marked by a black costal spot, thence continued as a narrow, sinuate, faint dusky line to the hind margin. T. p. line geminate, distinctly marked on costa thence interrupted, punctiform, marked by black or brown venular dots; outwardly curved over cell. S. t. line narrow, pale, interrupted, irregularly dentate. From the internal margin beyond the t. p. line an oblique blackish terminal shade extends to the apex, somewhat narrowing above the middle. Through this dark shade the s. t. line is picked out by pale scales. A row of black terminal lunules, preceded by pale defining scales. Fringes very long, with a central darker line, beyond which they are cut with blackish. Secondaries glistening white, somewhat smoky basally, and with a very broad black outer margin. Fringes white. Beneath, wings whitish, with a broad black terminal margin. Primaries with a whitish terminal line. Fringes white, on primaries narrowly cut with brown, becoming black at tip. Head with a brown frontal line, and a brown inter antennal tuft. Collar black tipped, and behind it the thorax is powdered with black scales. Abdomen very pale luteous. Expands 1.25 inches; 31 mm.

Hab.—Colorado.

A single ♀ in Mr. Tepper's collection. A distinct species; the collar is evidently produced medially, and there is an evident basal tuft. The dark terminal space is characteristic.

Since the above was written I have seen other specimens from the same State which agree perfectly with the typical specimen; there is not much opportunity for variation apparently.

Group LEVIS.

The species referable here have a peculiar *fascies* at once recognizable. The fringes are unusually long and even on both wings, the secondaries with rather well defined dark outer margins. The maculation of primaries is all distinct, the lines being geminate and defined, the s. t. line more or less punctiform and preceded by irregular black spots. The ordinary spots are well defined and marked by paler annuli; the color is gray, with a more or less evident luteous admixture.

Levis has a distinct yellowish shade to secondaries, and a deeper shade to primaries than the other species. The orbicular is oblique, oval, the reniform discolored and prominent. The species is very readily distinguished from the others by these characters.

Simplex lacks the distinct yellow shades, the orbicular is oval, but not oblique, the reniform concolorous, the spots preceding s. t. line are very distinct and sagittate.

Augustus has the orbicular round. It is a more distinctly cinereous species and the reniform is concolorous. The spots preceding s. t. line are not so prominent as in the preceding species.

Irrespective of all other characters the orbicular in these three species affords a safe distinguishing feature. It is oblique in *levis*, oval in *simplex*, and round in *augustus*.

Iricolor is at once obviously distinct from all the preceding by the very prominent and beautiful metallic shade to the dark blue scales of the primaries.

In brief the species are separable as follows:

Secondaries with a decided yellowish shade; orbicular oblique, oval, reniform discolored ..... **levis.**

Secondaries without the yellowish tinge, smoky or dirty white.

Reniform concolorous, orbicular oval, not oblique ..... **simplex.**

Reniform concolorous, orbicular round; color more cinereous..... **augustus.**

Primaries marked and shaded with metallic dark blue scales..... **iricolor.**

O. levis Grt., Can. Ent. 1880, xii, 254.

Head, thorax and primaries dusty ochery with paler shadings. Primaries with the maculation distinct, neatly marked. Basal line distinct, geminate, inner line black, the outer fuscous, included space somewhat paler. A paler shade through the superior portion of basal space, variably distinct in the specimens at hand. T. a. line geminate, inwardly oblique from the costa, strongly and rather irregularly dentate; a narrow black line connecting it with the basal line. T. p. line geminate, inner line black, outer line somewhat incomplete, fuscous, included space paler, somewhat lunulate, a wide outward bend over reniform, and somewhat incurved below that spot. The claviform is distinct,

somewhat paler, black margined and narrowly white ringed. Orbicular oval, oblique, white ringed, with narrow black margin, the centre slightly paler. Reniform normal, of a good size, black margined, whitish filled, with a central ochery lunule. The cell between the spots is blackish, continued beneath across the wing as a rather narrow blackish shade line rather close to and parallel with the t. p. line. S. t. line pale, interrupted, somewhat punctiform, preceded by irregularly sized and formed black spots, and followed by smaller and less distinct spots. A row of black terminal lunules. Fringes long, whitish, an ochery line at base, and a central fuscous line. S. t. space with a well marked paler shade opposite cell, and again in the submedian interspace. The costal region is also paler in some specimens, the transverse lines marked by distinct black spots. The veins are somewhat pale marked to the t. p. line, and beyond that black marked. In some specimens pale rays accompany the veins and encroach on the terminal space. Secondaries whitish, with a more or less marked yellowish tinge, and with a well marked black border. Fringes white or yellowish. Beneath, primaries smoky, with an outer line, distinct about half way across the wing and a broad blackish outer margin. The ordinary spots are faintly reproduced. Secondaries as above, but paler. Head with black scales between the antennæ. Collar with a transverse black line at base and a fuscous line at middle, which is sometimes wanting. Expands 1 20—1.35 inches; 29—34 mm.

Hab.—Arizona, Colorado.

The Colorado specimens are darker in color than those from Arizona, and the latter have the secondaries nearly white, whereas in the Colorado specimens the yellow shade is distinct; the maculation varies somewhat in prominence, but is always distinct. The species is readily distinguished from its near allies by the distinctness of its maculation and the *oblique* orbicular.

The genitalia of the male have the harpe as usual, the tip very slightly oblique, inwardly fringed with a row of very fine spinules; the clasper is from about the middle of lower margin and extending about across the harpe somewhat dilated at its middle and gradually narrowing to a long acute point.

A type specimen is in the U. S. National Museum collection (coll. J. B. Smith); other specimens in various collections.

O. simplex Smith, Insect Life, 1888, i, 20.

Head, thorax and primaries powdery fuscous, the maculation distinct. Basal line distinctly traceable, geminate. T. a. line upright or slightly incurved, strongly dentate, geminate, the outer line black, inner line fuscous brown, included space somewhat paler. A narrow black line from base to t. a. line. T. p. line faintly geminate, inner line only distinct, black, slightly lunulate, exserted over reniform and somewhat incurved below. Claviform very long, almost crossing median space, black margined, with a pale inner line and concolorous centre. Orbicular longitudinally oval, pale ringed, concolorous. Reniform moderate in size, pale ringed, with narrow black margin, the centre somewhat paler. A faintly marked median shade between the ordinary spots, less marked below

median vein. S. t. line pale, interrupted, irregularly sinuate and dentate, preceded by a series of long sagittate interspaceal black dashes. A row of black terminal lunules S. t. space pale at t. p. line, rapidly darkening to the s. t. line. The veins are paler through the darker parts of the wing and black marked beyond. Secondaries white, semi-transparent, with a distinct black outer border. Fringes white. Beneath whitish, with smoky black outer border. Head with an interantennal blackish line followed by a pale line. Collar with a black line inferiorly, black tipped and a whitish line below the black tip. Thorax also sprinkled with black scales. Expands 1.46 inches; 36 mm.

Hab.—Ashley Valley, Utah.

A single rather rubbed specimen without fringes to primaries in Mr. Henry Edwards' collection.

This species is closely allied to *levis*, the most obvious superficial distinction being found in the longitudinally ovate orbicular. The ground color is not ochreous and there are other minor differences in maculation as can be noted by comparing the description. I should scarcely, however, have described this specimen as distinct, but for the decided difference in the genital structure, which in this genus is so true to one type. The harpes are elongate, the inferior margin curving regularly and gradually to an acute junction with the superior margin, the inner edge of terminal margin fringed with long stout spinules. This is very different from the harpes in *levis*; the clasper, too, is different. It is even for two-thirds of its length, then the inner side is abruptly cut, leaving a long, slender, acutely terminated spur as the continuation of the outer margin.

The species holds an intermediate position between *levis* and *augustus*.

O. augustus Harvey, Bull. Buff. Soc. N. Sci. 1875, iii, 73, pl. 3, fig. 5; Grt., Bull. Geog. and Geol. Surv. iii, 176.

Head, thorax and primaries dark ashen or fuscous gray, powdery, varying somewhat in shade. Primaries with the maculation distinct, neatly cut. Basal line present, geminate, inner line black, outer line fuscous, included space somewhat paler than ground color. T. a. line upright or slightly oblique outwardly from costa, geminate, dentate, the outer line black, the inner fuscous, included space paler. T. p. line geminate, the lines narrow, the outer indistinct, slightly lunulate, outwardly curved over reniform and then rather evenly oblique to the inner margin. Claviform present, somewhat paler than ground color, not well defined, margined by a few black scales. Orbicular large, round, pale ringed, centred with a paler, more ochery fuscous. Reniform of the usual shape, pale ringed and centred as in the orbicular. The outer portion of median space is somewhat darker and the median shade is obscured and scarcely traceable in the majority of specimens. S. t. space pale at t. p. line, darkening to the rather broad, diffuse, pale, interrupted s. t. line, which is irregularly and somewhat prominently dentate on the veins. A few darker, irregular spots precede this

line in the lower part of its course. A row of dark fuscous terminal lunules. Fringes very long, pale at base, darkening outwardly, and there faintly cut with blackish. Secondaries white, somewhat iridescent, with a faint discal lunule, a narrow median line and a broad, smoky outer band. Fringes long and white. Beneath, the primaries are glistening, smoky and somewhat powdery outwardly, with an outer line distinct about half way across the wing, a dusky discal spot and a row of terminal lunules. Secondaries white, a small discal spot, a distinct narrow median line not reaching the internal margin; a narrow, somewhat indefinite and incomplete smoky outer margin, and a series of fuscous terminal lunules. Collar with a dusky line at base, and a similar line near tip, below which is a whitish shade. Thorax also with black scales intermixed. Expands 1.25—1.37 inches; 31—34 mm.

Hab.—Texas (October), Colorado.

This species, originally described from Texas, I have seen only from Colorado, quite a number of specimens having been taken of recent years in that State. The species is readily distinguished by the distinct maculation, pale color, round reniform and white secondaries, which show a distinct discal lunule, as well as a narrow outer line in addition to the usual dusky outer margin.

The harpes of the male genitalia are somewhat curved, narrowing toward tip and there somewhat truncate, the angles rounded; an oblique row of spinules at inner side of tip. The clasper rises from the middle of inferior margin and does not extend the full width of the harpe. It is even for about half its length, then narrows rapidly from the inner side and terminates in a long, acute point, resembling *simplex* somewhat in this respect, but with a different harpe.

O. iricolor Smith, Insect Life, 1888, i, 19.

Head, thorax and primaries somewhat pale luteous, the primaries more or less powdered with bluish black atoms which have an iridescent, metallic glitter. Basal line present, black, followed by a narrow pale line. T. a. line geminate, outer line black, inner line more or less punctiform, the included space pale. As a whole, the line is somewhat irregular, very slightly curved outwardly. At the inner margin the line is preceded by a large patch of metallic dark scales, which in one specimen crosses the entire wing and in the other is limited to the inferior third. Claviform small, pale, not defined; orbicular rather small, round, a little irregular, pale ringed, centre concolorous. Reniform moderate, upright, somewhat constricted medially, pale ringed; a somewhat fuscous median shade darkens the cell between the ordinary spots and continues as a narrower dark shade parallel and close to the t. p. line. T. p. line narrow, black, crenulate, interrupted, widely curved over the cell and then with a regular inward curve to the hind margin. The narrow black line is followed by a broader, more even pale line, from which point the s. t. space darkens and becomes metallic black to the irregular, pale and somewhat interrupted s. t. line; a row of terminal dusky lunules inwardly margined by pale scales. Fringes unusually long and pure white. Secondaries faintly yellowish, glistening, with a broad black border and

a distinct discal lunule. Fringes also pure white. Beneath, the wings are very pale whitish yellow with broad blackish outer margins, the discal spot of secondaries more distinct. Head with a few reddish scales between the antennæ. Abdomen like wings beneath. Expands 1.25 inches; 31—32 mm.

Hab.—Colorado.

Three specimens from Mr. Tepper; one ♀ in coll. U. S. N. Mus. (Smith coll.).

This is perhaps the most beautiful species of the genus, the metallic dark scales and the very long white fringes offering distinctive characters. The specimens differ considerably in the amount of metallic irroration, the one so covered as to darken the entire specimen, the other, and better specimen with the dark markings only, metallic. The species is most nearly allied to *augustus* Harvey.

Since the description was first published I have seen several other specimens none of which offer any new characters. The metallic scales are distinctive and are obvious in all the specimens.

Group HOMOGENA.

The species referred here have no strong band of union; they are all very distinct from each other and do not agree with any of the other groups. There is no one strong feature to unite them and negative characters only associate the species; they agree in not belonging to any other group. In all the normal maculation is distinctly traceable.

Saundersiana differs from all the other species in the distinctly geminate, even, dark median lines and strongly dentate s. t. line. The posterior thoracic tuft is darker, the claviform is distinct and there is a very even, distinct, upright median shade.

Behrensi has the lines also geminate, but much less distinct; the color is a very even, obscure fuscous and the maculation only slightly darker. The s. t. line here is punctiform, pale, and the body vestiture is thick. It has the appearance of a *Mamestra* allied to *chenopodii*.

Right here must belong *pernotata* Grote, with which I am unacquainted. It is said to lack the s. t. line and to have a solid black claviform. Mr. Grote compares it with *saundersiana*, to which indeed, from the description, it seems very close.

Glennyi differs from all the others by its sordid, powdery appearance, a yellowish fuscous shade extending over the whole insect; the

maculation is all present, but is not very distinct. The s. t. line is irregular, paler, preceded by a darker shade. It is larger than the preceding species.

Homogena is allied in maculation, but is much brighter and a somewhat smaller species; the lines are very distinct and are single. The basal space is paler than the median, the t. p. line followed by a whitish shade, darkening again to the s. t. line, which is irregular and very much as in *glennyi*, but much more distinct. It is not readily confounded with any other species.

Occata is a smaller species, of which I have seen only two specimens. Its salient feature is the strongly incurved t. p. line, the small, neatly marked ordinary spots, even median shade and paler basal and s. t. shades. The s. t. line consists of a series of white and black dashes, which are obscure in one specimen. Mr. Grote's figure of the species is a good one.

Meadiana is deep ashen gray and has the appearance of a *Mamestra* allied to *anguina*. The lines are faintly marked, the s. t. very indefinite; the orbicular is unusually large with blackish ring and centre; the reniform is also dark, somewhat incompletely outlined, stained with reddish.

Fortis has the color and habitus of an *Homohadena*, as which it was described and now stands in our lists. It has the deep brownish fuscous color of that genus, somewhat paler occasionally, and the median lines are usually punctiform, rarely lunulate, with the venular dots stronger.

Despite the differences of *habitus* the genital structure remains constant in type.

A tabular statement of such a mixture is unsatisfactory and will not be presented. The above review, aided by the detailed descriptions, should be sufficient.

O. saundersiana Grt., Can. Ent. 1876, viii, 29.

Head, thorax and primaries grayish fuscous. Primaries with basal and s. t. space pale ash gray. Basal line fuscous, distinct, geminate. T. a. line with a slight outward curvature, very distinct, geminate, the inner line darkest, black. T. p. line bisinuate, the curvatures small, very even, distinctly geminate. S. t. line pale, very deeply and prominently dentate, the teeth entirely crossing the dusky terminal space and emphasized by blackish shades and dashes on both sides of the line. Claviform small, distinct, concolorous, black ringed. Orbicular round, rather large, ringed with fuscous, within which is a pale annulus. Reniform large, normal in shape, rather indistinctly defined, somewhat paler outwardly and inferiorly darker filled; median shade very distinct, rather nar-

row, even, crossing between the ordinary spots. Secondaries whitish basally, with a rather well defined outer blackish margin, an indistinct discal lunule and a faint extra discal line. Beneath, primaries smoky, secondaries much as above, the discal lunule and extra discal line better marked. Thorax with collar smoky or blackish, as is also the very distinct posterior tuft. Expands 1.12 inches: 28 mm

Hab.—Texas, Canada, Illinois.

A single male specimen is in the National Museum (Belfrage coll.) easily known by the very even, distinctly geminate median lines and the very prominently dentate s. t. line.

The genitalia are much as usual; the harpes are a trifle obliquely rounded at tip, which is inwardly fringed with spinules. From the middle of inferior margin arises the clasper, which narrows rather abruptly from the inner side and extends beyond the harpe in a long, acute and slightly curved spur.

The species is somewhat aberrant in the very distinct basal thoracic tuft, but otherwise fully agrees with the characters of the genus.

Mr. Grote's description of the species is somewhat different, but I can scarcely believe that it refers to another species. I have seen no specimens named by Mr. Grote himself and I present his description for comparison and as additional to my characterization. Should the present species really prove different it might be called *geminata*.

"Fore tibiæ with a terminal claw. Allied to *Oncocnemis occata* from Texas and California. Differing as follows: Head and thorax black. Median space darker than basal and terminal spaces, which latter are washed with white. Median lines twice further apart inferiorly than in *occata*. Median lines *even*, not scalloped. Median shade black, not very diffuse. Ordinary spots larger; orbicular with an evident dark centre. The dentations of the s. t. line connected, followed by a vivid white line. Fringes wholly black, not checkered as in *occata*. Hind wings much as in *occata;* a terminal, vague, broad, blackish band, within which is seen the median line; fringes white. Beneath less brown than in *occata*. Expanse 28 mil."

Hab.—Canada, Illinois.

O. behrensii Grote, Bull. Buff. Soc. N. Sci. 1874, ii, 65; Bull. Geog. and Geol. Surv. iii, 116.

Head, thorax and primaries with an even, dull, deep ashen gray, over a yellowish ground. Primaries with the ordinary maculation present, the lines fine and hardly relieved. Basal line present, indistinct, geminate. T. a. line geminate, upright, sinuate rather than lunulate. T. p. line geminate, outer line somewhat diffuse and even, inner line slightly crenulate. Its course very much as usual, exserted over the reniform. The median shade is indistinct, diffuse, darkening the cell between the ordinary spots and then crossing the wing rather close to and parallel with the t. p. line. Claviform large, slightly paler, not defined.

Orbicular large, round, obscurely pale ringed, concolorous. Reniform large, concolorous, obscurely pale ringed. S. t. line pale, irregular, interrupted, preceded by a series of blackish spots of various forms and sizes. The terminal space dusky; a pale terminal line. Fringes with a sinuous darker line. Secondaries whitish toward base, dusky outwardly and with an indefinite terminal band. Beneath, primaries smoky, darker outwardly and with an outer dusky line not extending more than half way across the wing. Secondaries paler, powdery, with a distinct discal spot and an outer line. Collar with a basal transverse line and another near tip. Expands 1.12 inches; 28 mm.

Hab.—California (February).

In this species the color and maculation are obscure. Unlike *glennyi*, there is no powdering, so noticeable in that species, and the lines are distinctly double.

The only male examined lacked the abdomen and the genitalia could therefore not be examined.

O. pernotata Grt., Can. Ent. xv, 25.

"Allied to *saundersiana;* base of primaries washed with light gray; t. a. line double, even, dark brown, slightly curved. Orbicular and reniform subequal, completely defined, gray, with central mark; claviform solid, black. T. p. line double, a little uneven, running inwardly and nearing t. a. line on internal margin. S. t. line wanting. Veins marked with black terminally. Median and subterminal fields washed with light gray; terminally the wing is brownish. Collar light yellowish gray; head darker. Fore tibiæ armed with a claw. Eyes naked. Hind wings with broad, diffuse, blackish border and white interlined fringe. Beneath, slightly yellowish with broad borders to both wings; a dot and fragmentary inner mesial line on hind wings. Thorax gray; abdomen yellowish gray."

Hab.—Arizona. Collection B. Neumoegen.

O. glennyi Grt., Bull. Buff. Soc. Nat. Sci. 1873, i, 141, pl. 4, fig. 17.

Dull powdery fuscous, the color even over the head, thorax and primaries. Maculation of primaries distinct, but not prominent. Basal line black, single, not well marked. T. a. line black, indistinctly geminate, the outer line only distinct, its course outwardly oblique, with three obtuse outward angulations. T. p. line apparently single, outwardly exserted over reniform, toothed on the veins. Median shade barely traceable through the outer portion of median space. Claviform rather short, concolorous, imperfectly outlined by black scales. Orbicular rather large, round, concolorous, black ringed. Reniform large, concolorous, incompletely black ringed, preceded by a dusky shade; a row of fuscous terminal lunules. Fringes moderate in length, concolorous. Secondaries pale whitish fuscous basally, with a somewhat indefinite discal lunule, a narrow outer line, and a broad, somewhat indefined outer band. Wings beneath powdery fuscous, with small discal spot, somewhat punctiform outer line, incomplete on primaries and a diffuse outer dusky band. Thorax with a basal dark line and a dark line near tip. Expands 1.37—1.50 inches; 34—38 mm.

Hab.—Colorado.

The uniform powdery fuscous color is distinctive, the markings while all present are not prominent.

The harpes of male are moderate, somewhat curved, the lower margin curving obliquely to an acutely rounded tip, the inner-side fringed with spinules. The clasper is an unusually long, slender, somewhat curved hook, obliquely crossing the harpe and extending somewhat beyond it. The species is unique in this respect.

It seems to be rare.

O. homogena Grote, Bull. Geog. and Geol. Surv. iii, 800.

Head, thorax and primaries pale, somewhat yellowish gray. Primaries with basal space evenly pale, powdery. Basal line single, black, distinct. T. a. line broad, black, single, even, oblique, with a slight outward curve. T. p. line narrow, single, rather evenly curved over the reniform, with small outward teeth on the veins below that point. Median space darker than the remainder of the wing. Claviform marked by a small, irregular black patch on the t. a line. Orbicular rather small, round, pale, edged with black scales. Reniform large, of the usual shape, pale, but not discolorous, narrowly and incompletely edged with black scales. A darker, diffuse, and irregular median shade between the ordinary spots and somewhat inwardly oblique, unusually close to the t. a. line. S. t. space whitish powdered beyond t. p. line darkening to the s. t. line, which is very distinctly defined by this dark shade. It is very irregular and diffuse, marked with white scales and not distinctly defined from the terminal space; a row of fuscous terminal lunules. Fringes gray, cut with fuscous. Secondaries dirty white with a faint discal lunule and a somewhat well defined smoky outer band. Beneath, the primaries are smoky, paler toward inner margin, darker outwardly. Secondaries very much as above, but more powdery. Head with a frontal transverse dark line. Collar concolorous with basal space of primaries, and with a dusky basal line. Thorax darker, more mixed with blackish scales. Expands 1.25—1.40 inches; 31—35 mm.

Hab.—Colorado, Nevada.

A well marked species which I have seen from Colorado only. The strongly defined median space and the pale basal space limited by the broad, even black t. a. line are distinctive.

The genitalia of the male have the harpes somewhat curved, ending in a regularly curved, oblique tip, which is well fringed with spinules at inner-side; the clasper extends rather more than half way across the harpe, and is gracefully curved, gradually narrowing from the inner-side to an acute point.

O. occata Grt., Tr. A. E. S. 1874, v, 114, *Cleophana:* Bull. Buff. Soc. N. Sci. 1875, iii, 9 and 16, pl. 2, fig. 6, *Cleophana;* id. iii, 87, *Oncocnemis;* Stett. Ent. Zeit. 1876, v. 37, 136, *Oncocnemis.*

"♀.—The eyes are naked; the frontal vestiture converges from the sides, but conceals no clypeal protuberance. Tibiæ unarmed, but the fore tibiæ have a

blunt and short claw on the inside and a very short process outwardly. Collar pointed medially. Abdomen untufted. Collar above black, below gray-brown, tipped with pale gray brown. Thorax pale gray brown. Anterior wings gray-brown. Basal half line indicated. Median veins obsoletely geminate, very approximate below the median vein. Median shade black, very diffuse, almost entirely filling the median space below the vein and bringing into relief the small concolorous claviform. Ordinary spots concolorous, small, subequal; subterminal line consisting of whitish streaklets and points preceded by black longitudinal linear marks of unequal length and distinctness; subterminal space shaded with whitish gray, especially below vein [5]. Fringes checkered black and brown. Hind wings whitish at base with soiled veins and rather broad, shaded and even blackish hind borders. Abdomen pale. Beneath with a common line broken into dots on the secondaries which are whitish, irrorate on costal region and have diffuse blackish borders. Head black, with a pale interantennal line and pale oral squamæ and palpi. Expands 1.10 inches; 27 mm."

Hab.—Texas, California; April and May.

The above is Mr. Grote's description; the only specimen at hand (a ♀) is somewhat rubbed and agrees fully with Grote's characterization. Mr. Grote elsewhere corrects his generic reference stating that the collar was normal and not as above described.

O. meadiana Morr., Proc Acad. 1875, 60; Grote, Bull. Geog. and Geol. Surv iii, 117.

Head, thorax and primaries bluish ash gray. Primaries with basal line not traceable. T. a. line regularly curved outwardly, single and not very definite, marked rather by the somewhat darker median space. T. p. line incurved from the costa, cutting the inferior portion of reniform and narrowing the median space. Claviform wanting; orbicular well sized, black ringed, and with a black centre, else concolorous. Reniform moderate in size, incompletely ringed, stained with reddish; a distinct, somewhat diffuse median shade, crossing the centre of the space through the orbicular. S. t. line pale, irregularly interrupted, preceded and followed by irregular and not very definite blackish marks and shades; a series of black terminal lunules; a white line at the base of the otherwise concolorous fringes. Secondaries whitish, with an indefinite, smoky outer border. Beneath, primaries smoky, somewhat pale powdered outwardly. Secondaries white, outwardly smoky, very much as above. Expands 1.12 inches; 28 mm.

Hab.—Arizona.

This species seems rare, and I have seen the ♀ type only from Mr. Tepper's collection. It is extremely close to *occata* in all respects, the difference being chiefly in the larger orbicular and stained reniform. The median space also is not so dark.

O. fortis Grt., Can. Ent. 1880, xii, 257, *Homohadena*.

vorax Behrens, Papilio, 1884, iv, 21, *Agrotis* (larva only); Smith, Papilio, iv, 114, *Polia* (desc. imago).

"Of a dusky fuscous, paler than [*Homohadena*] *incomitata*. Basal dash obsolete; no dash on median space. Median lines accentuated on the veins, very

narrow, black and single, anterior line perpendicular. Posterior line with a rather long and narrow extension beyond the disc; lunulate between the veins, which are marked with black points; a succession of pale marks preceded by very slight dashes indicates the subterminal line; a row of terminal black points. Fringes shaded, paler than the wing. Hind wings white, subpellucid; the nervules soiled; a vague terminal fuscous shading; fringes whitish. Head and collar darker shaded than the thorax, dusky fuscous. Stigmata indicated by paler shading; orbicular ovate, elongate; reniform moderate, upright; claviform indicated. Expands 1.60 inches; 40 mm."

Hab.—Nevada.

The above is Mr. Grote's description, and it excellently characterizes the type (a female) in Mr. Tepper's collection. A series of California specimens doubtlessly the same species, but forming the types of *Polia vorax* Behrens, differ sufficiently to induce a repetition of that description:

"Primaries even, dark brownish gray; stigmata obsolete; transverse lines barely indicated by black venular dots; a slightly darker s. t. shade, intensified into blackish on the veins; an interrupted lunate terminal line, or more properly a series of lunate terminal spots. Fringes yellowish at base, else concolorous. Secondaries pearl-gray, veins and outer margin more smoky; a yellowish line at base of fringes. Beneath, primaries glistening smoky gray, paler on disc; secondaries as above, a transverse line of venular dots beyond the middle. Head, palpi and collar dark red-brown; thorax concolorous with primaries; abdomen concolorous with secondaries. Expands 1.50—1.60 inches; 39—40 mm."

Hab.—California.

The species was locally quite common one year, but seems not to have been taken in any numbers before or since; the unfortunate generic reference of Mr. Behrens' species, for which I am responsible, was caused by the defective condition of the specimens, which caused me to overlook the armature of the fore tibia. The heavily lashed eyes induced the reference, which was felt at the time to be a questionable one. Mr. Grote's type, otherwise perfect, also lacks the fore legs. Other specimens since seen show the claw distinctly, and so though closely allied in appearance to some species of *Homohadena*, it must find a place here unless a new genus be created for its reception. In view of the present composition of the genus this is scarcely advisable. Unfortunately no male has been available for dissection.

Group CHANDLERI.

The species referred here all agree in the ashen gray ground color, over which the wing may be fuscous, luteous, or with blackish powderings. The transverse lines are obsolete, the claviform is long and narrow and connected with base by a slender line; the orbicular is

narrow, elongate and sometimes fused with the reniform; the s. t. line is pale, interrupted and irregular, preceded by sagittate black dashes, which are placed in a pale halo. The species are thus distinguished from *cibalis* and *gracillima* in which there is a decided and continuous dark shade preceding the s. t. line.

Of the species placed here *chandleri*, the type of the group, is darkest, the markings most contrasted; the ordinary spots are fused, and the secondaries have the black margin distinct.

Riparia, long considered a variety of *chandleri*, is readily distinguished by the luteous shading and the distinctly separated ordinary spots; the secondaries have the outer margin indefined, smoky. The underside in *chandleri* has the wings with definite dusky outer margins, while in *riparia* and *major* the disc is smoky, and outwardly the wing paler.

Major, which is really much closer to *riparia* than is *chandleri*, differs from both by the very even, powdery gray of primaries; the markings are very illy defined and the ordinary spots nearly concolorous and not fused. The secondaries are inclined to be smoky throughout and the outer dusky margin is not defined.

Aqualis Grote is unknown to me. Mr. Grote says it resembles *chandleri*, but the interspaceal black dashes are not interrupted by a s. t. line, which is said to be wanting. It is therefore essentially different from all the preceding species in which this line is well marked.

In synoptic from the species are separable as follows:

Subterminal line distinct.
Ordinary spots fused, primaries dark ..... **chandleri.**
Ordinary spots distinctly separated.
Primaries luteous gray, the ordinary spots very distinctly pale ringed. **riparia.**
Primaries even, dark ash-gray, the ordinary spots not well defined.. **major.**
Subterminal line wanting..... **aqualis.**

Belonging here, but not readily placeable in the series without autoptic acquaintance, is *oblita* Grt., which I have not seen. The s. t. line and spots are as in *chandleri*, the claviform very long. It is not distinctly stated whether or not the ordinary spots are in some way joined, but the reniform has an inferior spur making it ⊥ shaped.

O. chandleri Grt., Bull. Buff. Soc. N. Sci. 1873, i, 107, pl. 3, fig. 9; id., 1875, iii, 87; Bull. Geog. and Geol. Surv. iii, 117.

Head, thorax and primaries rather dark fuscous gray, the markings distinct, white and black. Ordinary lines marked only on costa, the t. p. line sometimes traceable for its full length across the wing, then very fine, lunulate, widely

exserted over reniform; a black longitudinal line at base, reaching into the elongate narrow orbicular, which almost crosses the median space, and is distinctly black ringed. It is whitish, with a central dusky line. Orbicular elongate, confluent with the somewhat triangular reniform; the combined spot is black margined, then white ringed, the centre a trifle paler than the ground color. Through the subterminal space is an oblique, diffuse, pale shade. T. p. line white, interrupted, strongly dentate, preceded by a series of sagittate black dashes, which are narrowly and somewhat indefinitely pale margined; a row of terminal black lunules. Fringes pale, cut with fuscous, and with a central line of same color. Secondaries white at base, with a more or less visible discal lunule and a distinct, broad, blackish outer margin. Fringes white. Beneath white, powdery, with broad black margins on all wings. Collar with a basal and terminal blackish line; thorax black powdered. Expands 1.25—1.35 inches; 31—34 mm.

Hab.—Colorado, Nevada.

A very distinctly marked species, readily recognizable by the confluent ordinary spots and the dark and light contrasting maculation. The genitalia are somewhat peculiar; the harpes are normal with a rounded oblique tip inwardly fringed with small spinules. The clasper is broad, very decidedly concave and dilated at middle, and as abruptly narrowed to an acute tip; very different from all other species in that respect.

O. riparia Morr., Can. Ent. 1875, vii, 213, *Oncocnemis*, var. *chandleri;* Grt., Bull. Surv. iii, 117, var. *chandleri;* Can. Ent. 1880, xii, 256 = *chandleri;* Bull. Buff. Soc. N. Sci. 1876, iii, 87 = *chandleri;* Stett. Ent. Zeit. 1876, v, 37. 117 = *chandleri;* Pap. 1880, i, 34, an. sp. dist.?; Tepper, Bull. Bklu. Ent. Soc. 1879, i, 31 (locality and habits).

Head, thorax and primaries very pale luteous gray. Primaries with the ordinary lines lost or but faintly marked on costa. A longitudinal black line from base terminating in the long narrow claviform which is white marked and narrowly defined by black scales. Orbicular very long, with very narrow defining ring of black scales, a well marked white ring and a central concolorous line, sometimes also marked with black scales. Usually this spot is well separated from the reniform, rarely it touches it, and in no specimen seen by me do the spots become confluent as in *chandleri*, though this may happen. Reniform moderate in size, hardly defined, white marked superiorly. S. t. line a more or less interrupted series of white spots, preceded by sagittate black or fuscous spots, which are usually edged with indefinite white shades. This is very variably distinct, one specimen lacking all but a single white margined spot, while another has an almost continuous line. No distinct terminal lunules. The costal region is usually powdered with white, and there is sometimes a whitish shade through the s. t. space. Secondaries white, with a variably distinct dusky outer border, the entire wing sometimes becoming smoky. Beneath white powdery, primaries a little smoky outwardly and on disc, secondaries with a discal lunule. Collar whitish, with luteous gray tips, and less distinct basal line. Expands 1.30—1.50 inches; 33—37 mm.

Hab.—Long Island and Buffalo, N. Y.; Isle of Shoals, Mass.

This very distinct species was first described by Mr. Morrison as a local form of *chandleri*, and Mr. Grote for some time was not inclined to grant it even varietal rank. In his later papers he queries its being a variety and in the new Check List it appears as a good species. In this latter opinion Mr. Grote is correct. The species is readily separated by the ground color, which is constant, by the fact that the ordinary spots are not confluent, by the indefinite band of secondaries, and lastly by the very different genitalia. The harpes are not unlike that of *chandleri*, but the clasper is rather short, sides parallel to near tip, where it abruptly narrows from inner side and terminates in a moderately long, curved, acute spur. Mr. Tepper has found the specimens in crevices of bath-houses along the beach of Long Island. It is not common.

O. major Grt., Pap. 1880, i, 33.

curvicollis Grt., Can. Ent. 1883, xv, 10.

Head, thorax and primaries ash-gray, variable in depth. Primaries with the transverse line visible only on costa, else obsolete; a narrow variably distinct black longitudinal basal line reaching into the elongate claviform which is narrowly black ringed and may be either concolorous or distinctly paler than the ground color. Orbicular elongate, somewhat dilated outwardly or clavate, not reaching the reniform in the specimens before me. Reniform moderate, normal in form, more or less distinctly, but always very narrowly black ringed, concolorous, or slightly paler, sometimes superiorly only. S. t. line pale, interrupted, more or less punctiform, preceded by a more or less evident series of black or fuscous sagittate marks indistinctly pale ringed. No evident terminal lunules. Fringes fuscous, cut with pale; the veins are more or less marked with black scales. Secondaries smoky fuscous, paler basally; in some specimens whitish, with an indefinite smoky outer border. Beneath, primaries smoky basally and on disc, whitish outwardly. Secondaries paler, white, powdery with a variably distinct discal spot and a punctiform outer line. Collar with base and tips dusky, centrally paler. Expands 1.30—1.40 inches; 33—35 mm.

Hab.—Arizona, Colorado.

This species varies somewhat in the depth of the gray ground color and consequent distinctness of maculation, but not otherwise. The characters given by Mr. Grote to separate *curvicollis* from *major*, are evanescent and a comparison of types proves them identical. It is regrettable that the name *curvicollis* cannot be retained since it refers to a character more or less marked in most specimens, while *major* conveys an erroneous impression of size. I regret that the genitalia could not be well studied. The harpes are very like those of *O. glennyi*, while the clasper, which was detached and broken,

seems to be very broad at base, suddenly narrowed to a rather slender, somewhat curved process; the whole bearing an odd resemblance to a butter scoop.

O. aqualis Grt., Papilio 1880, i, 33, *Oncocnemis*.

"♀.—Eyes naked; fore tibiæ with a claw. Related to *chandleri*, but stouter. Fore wings bluish white, gray over blackish; all the lines obliterate; subterminal line wanting. The gray concolorous stigmata with difficulty perceived; all three present; veins obsoletely marked; a distinct series of black interspaceal terminal lines or streaks. Hind wings soiled, slightly iridescent, fringes whitish, interlined. Collar light gray, dusky behind, narrowly lined in front; head blackish. Beneath paler, discal spots present; hind wings whitish, irrorate, with a dotted exterior line feebly marked. Expanse 38 mm.

"*Hab.*—California.

"This Californian form differs by the black interspaceal dashes not being interrupted by a transverse pale shade which only shows in *chandleri*, where it cuts the dashes, but in var. (?) *riparia* broadens into a whitish, diffuse, s. t. line."

O. oblita Grt., Bull. Surv. iii, 117.

"Fore tibiæ with a short claw; fore wings hoary gray, with pale brown shades on disc across the reniform and on submedian interspace. Lines obliterate. Orbicular elongate, with fine white annulus. Reniform dark, narrow and lunate above, below joined to a white patch on median vein, bordered with dark scales above and stretching backward so that the whole spot is L-shaped. Claviform curved, very long, reaching to the t. p. line, bordered with white, wide and prominent. T. p. line barely indicated by a gray shade, produced opposite the cell, curved inwardly below the median vein; subterminal line composed of blackish spots in a whitish intervenular shade situated very near the margin. Hind wings pale fuscous with white fringes. Thorax and head gray, being composed of black and white scales. Abdomen pale fuscous; fore wings pointed at apices, with straight costal margin. Wings hoary beneath. Expanse 30 mil.

"*Hab.*—Nevada; from Dr. J. S. Bailey. In color and ornamentation this species resembles the genera *Morrisonia* and *Actinotia*. In its present position it comes nearest to *O. chandleri*."

Group GRACILLIMA.

The two species which are rather arbitrarily separated under this title agree in pale gray color, obsolete median lines, very long claviform, fused ordinary spots and very prominent subterminal shade. As compared with the other species the primaries have the apices somewhat produced and the species seem slighter; they are closely allied to the species of the *chandleri* group, differing at a glance by the prominent s. t. shade as well as the somewhat produced wings.

Cibalis is larger and darker, the reniform dark filled.

Gracillima is small, paler, the reniform scarcely traceable—*i.e.*, incompletely defined.

O. cibalis Grote, Can. Ent. 1880, xii, 244.

Head, thorax and primaries ash-gray, primaries with somewhat luteous shadings. Median lines marked on costa only; a longitudinal black basal line reaching into the long, narrow claviform which is narrowly outlined with black scales and somewhat paler. Orbicular narrow, elongate, connected with the moderate upright reniform, which is similarly pale ringed and is darker than the ground color; a dusky shade on costa over the reniform. S. t. line pale, oblique and somewhat irregular, preceded by a very even distinct brown shade. Through the s. t. space the luteous shade is most distinctly visible between the veins; an even, continuous black, terminal line. Fringes concolorous, a pale line at base. Secondaries whitish, somewhat iridescent, with distinct discal lunule and an indefinite outer smoky border. Beneath primaries smoky, darker on disc and with a distinct discal lunule. Secondaries whitish, powdery, with a narrow discal lunule. Collar with a broad brown basal and terminal line, the central space with a yellowish tinge. Expands 1.37 inches; 34 mm.

Hab.—Colorado.

This species is readily distinguished by the distinct brown s. t. shade in combination with the fused ordinary spots, obsolete transverse lines, and larger size; the only other species similarly marked being very much smaller.

I have not been able to examine the ♂ genitalia very closely; the harpes are very much as in *chandleri;* the clasper I have been unable to make out. This species appears rare, very few specimens being known in collections.

O. gracillima Grt., Can. Ent. 1881, xiii, 231.

Head, thorax and collar pale, whitish gray. Primaries with the median lines obsolete, barely marked on costa. Claviform elongate narrow, reaching from base to the s. t. shade, narrowly black margined. Orbicular narrow, elongate, fused with the small, upright and indefinite reniform. The two spots narrowly black ringed. S. t. line pale, irregular, preceded by an obvious brown shade, broken by black cuneiform spots about the middle; a paler shade precedes this s. t. shade superiorly. In the terminal space the s. t. line is followed by small, irregular dusky spots; a narrow and very even black line through the terminal space, beyond which the wing is more fuscous gray to the white line at base of fringes. Secondaries subpellucid with faint traces of a mesial band and a narrow line at base of fringes from which a smoky shade extends irregularly and indefinitely inward. Beneath, primaries smoky, secondaries white with a broken outer line and a dusky terminal line. Collar with a narrow basal and terminal line. Expands .75 inch.; 19 mm.

Hab.—Arizona.

This little species is recognizable by its size alone as well as its resemblance to *cibalis* in the prominent s. t. shade. The genitalia are unlike those of the other species; the harpes are long and narrow, the tip oblique and somewhat rounded, inwardly fringed with spinules The clasper is corneous, and consists of a rather strong, moderately long and slightly curved hook or process, the base of which is traceable to the base of the harpe.

Group ATRICOLLARIS.

The salient feature of the species referred to this group is the black longitudinal streak or shade of the primaries; the median lines are lost, the maculation is linear, the ordinary spots are indefinite—all as in the preceding groups, but an entirely different appearance is given by the longitudinal black shading, which in *atricollaris* extends from base to outer margin through the cell, and in *griseicollis* from the reniform outward. The latter species is not known to me in nature and may not be as close an ally of *atricollaris* as Mr. Grote considers it.

The genus *Copihadena* has been proposed for *atricollaris*, which in the narrower wings and different type of maculation seemed to have a fair basis. Mr. Grote has suppressed the genus, however, and perhaps with justice.

O. atricollaris Harr., Buff. Bull. 1874, ii, 273, *Homohadena;* Morr., Can. Ent 1875, vii, 91, *Copihadena;* Grt., Buff. Bull. 1875, iii, 73, *Oncocnemis;* Bull. Geog. and Geol. Surv. iii, 117, *Oncocnemis;* Pap. 1880, i, 34, *Oncocnemis.*

Head, thorax and primaries gray, with fuscous shadings and powderings. Primaries with all the transverse lines lost, or faintly marked on costa only; a prominent black longitudinal shade band through the centre of the wing from base to outer margin, forming the most obvious and characteristic feature of the maculation; a small white patch at extreme base. Claviform distinct, black ringed, paler filled, somewhat obscured basally by the dark shade. Orbicular narrow, elongate, fused with the small upright reniform; the spots faintly outlined in fuscous, more or less obscured by the longitudinal shade; a series of terminal, black interspaceal lines cutting the otherwise concolorous fringes Secondaries pure white, in the male with a narrow terminal line only, in the female with an indefinite fuscous outward shading. Beneath whitish, powdery, the primaries with a smoky outward shading. Head blackish powdered, with an inter-antennal white line. Collar with a distinct black line at base, above which is a distinct white line, the tip fuscous. Exp. 1.10—1.15 inch.; 27—29 mm

Hab.—Texas, Arizona.

The species is common, and is at once recognizable by the marked black longitudinal shade.

The harpes of male are rather broad at middle, narrowing rapidly to a narrow, somewhat rounded tip, which is inwardly fringed with spinules. The clasper arises from the middle of inferior margin, extends about three-fourths across the harpe, is then cut abruptly from the inner edge, the outer produced into a moderately long, somewhat curved, acute spur. In the male, too, the primaries are decidedly narrower than in the female, or in the more typical species of the genus.

O. griseicollis Grt, Can. Ent. 1882, xiv, 19.

"Allied to *atricollaris*, but smaller; the collar entirely whitish gray, head blackish. Eyes naked; the short fore tibiæ with a terminal claw; gray, of a whitish tone; under the glass the surface of primaries is whitish, sparsely mixed with black scales; the markings hardly visible to naked eye; under the glass the black, perpendicular, thread-like t. a. line is seen, and attached to it a subrounded, enclosed concolorous spot, the claviform. Similarly the concolorous orbicular and reniform may be seen ringed with fine black circles, the stigmata subequal, orbicular round, reniform upright, hour-glass shaped. Median space narrow, t. p. line indicated; a black dash from the reniform outward tapering to external margin. Similar fine interspaceal shades give the terminal space a slightly rayed appearance. Hind wings whitish, subpellucid. Beneath pale. Expanse 25 mil.

"*Hab.*—Arizona.

"This species is interesting as affording an ally to *atricollaris*."

List of the Species of ONCOCNEMIS Led.

♀

1. hayesi Grt.
2. dayi Grt.
3. mirificalis Grt.

♀

4. fasciatus Smith.
5. tenuifascia Smith.

♀

6. atrifasciata Morr.

♀

7. terminalis Smith.

♀

8. levis Grt.
9. simplex Smith.
10. augustus Harv.
11. iricolor Smith.

♀

12. saundersiana Grt.
13. behrensi Grt.
14. pernotata Grt.
15. glennyi Grt.
16. homogena Grt.
17. occata Grt.
18. meadiana Morr.
19. fortis Grt.
    vorax Behr.

♀

20. chandleri Grt.
21. riparia Morr.
22. major Grt.
    curvicollis Grt.
23. aqualis Grt.
24. oblita Grt.

♀

25. cibalis Grt.
26. gracillima Grt.

♀

27. atricollaris Harv.
28. griseicollis Grt.

EXPLANATION OF PLATE VIII.

1. Harpe and clasper of *O. hayesi.*
2. " " *O. dayi.*
3. " " *O. mirificalis.*
4. " " *O. atrifasciata.*
5. " " *O. levis.*
6. " " *O. simplex.*
7. " " *O. augustus.*
8. " " *O. saundersiana.*
9. " " *O. glennyi.*
10. " " *O. homogena.*
11. " " *O. chandleri.*
12. " " *O. riparia.*
13. " " *O. major.*
14. " " *O. cibalis.*
15. " " *O. gracillima.*
16. " " *O. atricollaris.*

ERRATA.

Page 5, line 14 from top, for 18 *read* 17.
" 5, line 13 from bottom, after convex, insert 13.
" 92, line 21 from top, for Blethsia *read* Blethisa.
" 99, line 5 from top , adde 10 *lineatus* Mann.
" 135, line 5 from top, for *sericeus* Forst., varius, *Fab.* read sericeus *Forst.* *varius* Fab. and omit *trivittatus* Mels.
" 138, line 4 from top, for Horn, x, *read* Horn, T. x.
" 147, line 9 from top, for vitis *Linn.* read obscurus *Linn.* var. *vitis* Fab.
" 148, line 10 from top, for Salisaceæ, *read* Salicaceæ.
" 159, line 5 from bottom, omit entire line.
" 164, line 12 from top, for closed *read* open.
" 232, line 22 from top, for Asiatic *read* Atlantic.
" 237, line 3 from top, for Galerucidæ, *read* Galerucide.
" 343, line 6 from top, for T. p. *read* S. t.
Pl. VII, transpose numbers 13 and 14.

PROCEEDINGS

OF THE

MONTHLY MEETINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

ACADEMY OF NATURAL SCIENCES,

PHILADELPHIA.

JANUARY 24, 1889.

Director Dr. HORN in the chair.

The following additions to the Library of the American Entomological Society were announced:

Canadian Entomologist, vol. xx, No. 12; xxi, No. 1. From the Editor.

Psyche, vol. v, Nos. 151–153. From the Cambridge Entomological Club.

Entomologica Americana, vol. iv, No. 9; v, No. 1. From the Editors.

Bulletin of the Museum of Comparative Zoology, vol. xvi, Nos. 2–3; xvii, No. 2. From the Museum.

Transactions of the Connecticut Academy of Arts and Sciences, vols. i–xvii. From the Academy.

West American Scientist, vol. iv, No. 37. From the Editor.

Third Bulletin of the Cornell Agricultural Experiment Station. From the Station.

Third Bulletin of the Massachusetts Hatch Experiment Station. From the Station.

Third and Fourth Bulletins of the Minnesota Experiment Station. From Alfred G. Baker.

Fourth Report of the Entomologist of New York. From J. A. Lintner.

Entomologist's Monthly Magazine, vol. xxv, Nos. 295–296. From the Conductors.

Butterflies of North America, by Wm. H. Edwards, vol. iii, Part 6. From the Author.

Insect Life, vol. i, Nos. 5–7. From the United States Department of Agriculture.

Study of the Cynipidæ, by C. P. Gillette. From the Author.

Biologia Centrali-Americana: Coleoptera, vol. ii, pt. 1, pp. 233–240, pl. 6, 17; vol. iv, pt. 1, pp. 425–464, pl. 19; vol. vi, pt. 1, pp. 57–112, pl. 5. Hymenoptera, vol. ii, pp. 25–32. By purchase.

Le Naturaliste Canadien, vol. xviii, No. 5. From the Editor.

Mittheilungen der Schweitzerischen Entomol. Geseilschaft. vol. vi, pt. 10; viii, pt. 2. From the Society.

Deutsche Entomologische Zeitschrift, 1888, pt. 2. From the Society.

Wiener Entomologische Zeitung, vol. i, Nos. 2–3. From the Editor.

Additamenta ad Prodromum Œdipodiorum, par H. de Saussure. From the Author.

Ricordi d'un Viaggio in Africa, per Studii Zoologici. From the Author.

Varieta e Specie Nouvre Tenthredinidei.—Trois Nouvelles espéces d'Apiaires.—Sugli Imenotteri della Lombardia, Pompilidei.—Nota d'Imenotteri, par Dr. P. Magretti. From the Author.

Recherches Experimentales sur la Vision Arthropodes, par Felix Plateau. From the Author.

Ninety-one authors' extras, excerpts, parts of journals, etc. From E. M. Aaron.

Toespraak van Prof. Dr. B. J. Storkvis.

Untersuchungen zur Morphologie u. Systematik der vogel, 2 vols.

Mr. E. M. Aaron, on behalf of the Executive Committee, reported the various changes made in the room since the last meeting, and alluded to the greater comfort, by the heating apparatus, to those using the rooms in the cold weather.

Written communications 220–221–222 were read by title and referred to the Publication Committee.

Mr. Calvert detailed the results of recent studies of Neuroptera, and reported the following captures in Maine by Miss M. Wadsworth, during the summer of 1888, not heretofore recorded from that region: *Argia violacea* Hag., very abundant, *Ischnura Ramburii* Selys, rare, *Anax Junius* Drury, *Gomphaeschna furcillata* Say, one ♂, *Aeschna Janata* Say, one ♂, *Gomphus spinosus* Selys, one ♀, *G. exilis* Selys, *Cordulegaster maculatus* Say, very common, *Epitheca Walshii* Scud., one ♂, *Cordulia semiaquea* Burm., common, *Libellula quadrimaculata* Linn., *Leucorhinia proxima* Hagen mss.

Mr. Calvert also desired to record the capture of a ♂ of the cosmopolitan *Pantala flavescens* Fab. at Mt. Pulaski, Logan County, Ill. The most Northern localities heretofore reported are Maryland and St. Louis. *Lestes eurina* Say has been taken by Mr. G. D. W. Williamson at Dobb's Ferry, N. Y., hitherto reported from Massachusetts and Illinois.

Dr. Horn illustrated the mode and extent of variation which he had found in some Halticini, notably in Systena, in one of the species the sculpture may be quite coarse, varying to entirely smooth, and the color, from piceous with vittate elytra to entirely yellowish white.

Mr. Wells gave an interesting account of a visit to Prof. French at Carbondale, Illinois, where he examined some Lepidoptera of interest, notably *Catocala ulalume* Strk., concerning which he made the following remarks: "I have always thought from reading descriptions only, that this species would prove to be a variety of *retecta*. Professor Grote, with some hesitation, admits it into his Check List. He expresses his opinion regarding this Catocala as follows: 'The description of *dejecta* is so vague that I have not included the name. *Ulalume*, equally poorly described, I have included on the strength of two typical specimens in my collection, purchased as such from Mr. Peck, and which appear to me distinct,' etc. Prof. French considers it a distinct species, and I incline to the same opinion. Upon comparing *ulalume* with *retecta*, seven or eight examples of which I have in my cabinet, I find the subreniform spot in the former closed, while in the latter it is open. The forewings in *ulalume* have a decided bluish tinge, the dark markings, with some exceptions, very indistinct, or altogether wanting, the usual patch outside the t. a. line made conspicuous by its bluish white color, in fact the *tout ensemble* of the insect impresses the eye as distinct. There seems to be some analogies between this Catocala and diminutive specimens

of *desperata*. It may be found to occupy a position intermediate between *retecta* and *desperata*. Whether this is a true species, or will prove to be only a variety, Prof. French, I have little doubt, will some day determine for us. I here append Prof. French's description of *ulalume*, which I regard the best I have read. The specimen he describes seems to differ in one particular from the one he so kindly gave me, in having the subreniform open; the description is as follows:

C. ulalume Strk.—Forewings pale bluish gray, transverse lines and shade quite prominent along the costa, rather indistinct elsewhere, very little brown along the transverse lines, subreniform open, a pale space outside the t. a. line reaching across the discal cell; t. a. and t. p. lines the usual distance apart. Expanse 2.75 mm.

Mr. Aaron spoke of the variations produced in some butterflies by the icing process, exhibiting drawings in illustration. The following were experimented upon and the effects of various degrees of temperature recorded, *Terias lisa* and *nicippe*, *Eudamus tityrus*, with some others.

February 28, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. v, No. 2. From the Editors.

Canadian Entomologist, vol. xxi, No. 2. From the Editor.

Proceedings of the Boston Society of Natural History, conclusion of vol. xxiii. From the Society.

Fifth Bulletin of the Nebraska Experiment Station—Bruner, on Injurious Insects. From the Station.

Entomologist's Monthly Magazine, February, 1889. From the Conductors.

Journal and Proceedings of the Royal Society of New South Wales, vol. xxii, pt. 1. From the Society.

Transactions and Proceedings of the Royal Society of South Australia, vol. x. From the Society.

Compte-rendu Société Entomologique de Belgique, sér. iii, Nos 105–107. From the Society.

Le Naturaliste, sér. ii, No. 31. From the Editor.

Horæ Societatis Entomologicæ Rossicæ, vol. xxii. From the Society.

Wiener Entomologische Zeitung, 1886. From the Editor.

A decade of new Hymenoptera, by P. Cameron. From the Author.

Synopsis of the Catocalæ of Illinois, by G. H. French. From E. M. Aaron.

Commencement of Study of Parasites of Cosmopolitan Insects, by L. O. Howard. From the Author.

Biologia Centrali-Americana: Coleoptera, vol. ii, pt. 1, pp. 241–256; pt. 2, pp. 313–336; vol. iv, pt. 1, pp. 465–476, pl. 20; Suppl. pp. 73–80, pl. 6. By purchase.

Monographie Iconographique Anthophoræ, par Dr. Dours. By purchase.

Etudes d'Entomologie, pt. 9, August, 1884. From E. M. Aaron.

Locustides Nouveaux on peu connus, par Alphonse Pictet. From the Author.

Synopsis de la Tribu des Sagiens, par H. de Saussure. From the Author.

The Finance Committee reported that they had examined the accounts of the Treasurer and found them correct. Report received and filed.

The Publication Committee reported in favor of accepting the following papers:

Contributions to a knowledge of the Lepidoptera of West Africa by Rev. W. J. Holland.

New Japanese Lepidoptera by Rev. W. J. Holland.

On the species of Macrops *Kirby* of North America by W. G. Dietz, M. D.

Reports accepted and publication ordered.

The Executive Committee reported their progress in work on the collections and library.

Papers 223–224 were read by title and referred to Publication Committee.

A communication was read from the Academy asking the co-operation of the Section at its meetings.

The Director explained the meaning of the request.

On motion the Recorder was directed to reply that the Section would gladly co-operate, but feel unwilling to select any special evenings.

On the table were twenty-four specimens of Lepidoptera presented to the Academy by Dr. Dolley, and placed in the care of the Section.

Dr. Skinner exhibited two cocoons of the Cecropia moth, and indicated the method of determining the sex from external appearance, the male having the cleaner cocoon.

Mr. Aaron exhibited a specimen of *Papilio philenor;* it had been captured in Logan Square, near by, on the 26th inst. The earliest appearance in this locality previously noted was May 20th, the usual time of appearance being June. He thought that the specimen exhibited had emerged in captivity and had escaped. Last year he had found the caterpillar on the moon vine, *Ipomea noctiluca.*

Dr. Horn exhibited a series of *Chætocnema* and *Longitarsus*, and explained the characters used in the separation of the species.

Dr. Skinner noted the reception from the northwestern territories of a milk-weed butterfly smaller than those taken in this locality.

Mr. Cresson desired an expression of opinion regarding the use of Napthaline in collections, stating that complaint had been made that it corroded the pins. The sentiment seemed to be that such an effect could not be charged to that material.

Mr. Aaron asked for an appropriation for special services on the part of the janitor. Carried.

Mrs. C. B. Aaron was elected to associate membership.

March 28, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Transactions of the American Entomological Society, vol. xvi, No. 1. From the Publication Committee.

Proceedings of the Academy of Natural Sciences, Philadelphia, 1888, pt. 3. From the Academy.

Proceedings of the Boston Society of Natural History, vol. xxiv, sigs. 3–6. From the Society.

Canadian Entomologist, vol. xxi, No. 3. From the Editor.

Entomologica Americana, vol. v, No. 3. From the Editor.

Psyche, vol. v, Nos. 154–155. From the Editors.

Entomologist's Monthly Magazine, March, 1889. From the Conductors.

Insect Life, vol. i, No. 8. From U. S. Dept. of Agriculture.

The Butterflies of North America, by Wm. H. Edwards, vol. iii, part 7. From the Author.

Berliner Entomologische Zeitschrift, 1888, pt. 2. From the Society.

Verhandlungen der k.-k. Zool.-Botan. Gesellschaft in Wien, vol. xxxviii, Nos. 3–4. From the Society.

Compte-rendu Société Entomologique de Belgique, sér. iii, No. 109. From the Society.

Species des Hyménoptères d'Europe et Algerie, No. 33. From the Author.

Sur le Bembidium biguttatum Fabr. et les formes voisines, par A. Preudhomme Borre. From the Author.

Recherches Experimentales sur la vision chez les Arthropodes, part v, par Felix Plateau. From the Author.

The following were by purchase:

Biologia Centrali-Americana: Coleoptera, vol. ii, pt. 1, pp. 257–264, pl. 18; iii, pt. 1, pp. 49–64, pl. 4; vi, pt. 1, pp. 81–88, pl. 36; vii, pp. 113–120. Hymenoptera, vol. ii, pp. 33–48.

Entomologiæ Brazilianæ, ab F. Klug.

Formicidæ of the Novara Expedition, by Dr. G. Mayr.

Memoires sur les Lepidoptères, vols. 1–3, par N. M. Romanoff.

Lepidopteren von Madagascar, von M. Saalmüller.

Rhopalocera Malayana, by W. L. Distant, parts 1–12.

Odonates de la region de la Nouvelle Guinee, par Selys-Longchamps.

Odonates des Philippines, par Selys-Longchamps.

Monographie des Libellulides d'Europe, par Selys-Longchamps.

Neurotteri Tirolesi, by Carlo Ausserer, part 1.

Die Ephemeriden und Psociden Sachsens, von M. Rostock.

The Executive Committee presented report of work done during past month.

The Publication Committee reported in favor of accepting the following papers:

Two new species of butterflies by Henry Skinner, M. D.

Synopsis of the genus Oxybelus found in North America, by Chas. Robertson.

Report accepted and publication ordered.

Mr. B. H. Smith presented 110 species of Coleoptera from Buda-Pesth to the collection of the Section.

Eighteen Dragon-flies, mostly from Japan and two from the United States, were presented by Mr. Calvert for the collection of the Am. Ent. Society.

Papers 225–226–227 were read by title and referred to Publication Committee.

Dr. Horn exhibited a complete series of *Chætocnema*, *Longitarsus* and *Psylliodes*, and referred to the secondary sexual characters, which were illustrated, showing their utility in the separation of species.

Mr. Aaron spoke on the classification of the diurnal Lepidoptera, in which an arrangement of families was suggested differing from that generally accepted.

A communication was read from the executors of the late Titian R. Peale regarding his collection of Lepidoptera and the desirability of keeping it intact, if possible, as a memorial to Mr. Peale. The subject was referred to the Executive Committee with power to act.

April 25, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. v, No. 4. From the Editor.

Canadian Entomologist. vol. xxi, No. 4. From the Editor.

Proceedings of the Boston Society of Natural History, vol. xxiv, March, 1889. From the Society.

Psyche, vol. v, April, 1889. From the Cambridge Entom. Club.

Entomologist's Monthly Magazine, vol. xxv, April, 1889. From the Conductors.

Compte-rendu Société Entomologique Belgique, sér iii, 2d Mars, 1889. From the Society.

Catalogue of Macrolepidoptera by H. Strecker, part 1. From the Author.

Rhopaloceres et Heteroceres, part 13, by H. Strecker. From the Author.

Histoire Naturelle des Insectes, par M. le Comte de Castelnau, 4 vols. 1840, colored plates. By purchase.

The Executive Committee reported progress of work during past month.

The Publication Committee reported in favor of accepting the following papers:

Contributions to a knowledge of the Lepidoptera of West Africa, Pt. iii, by Rev. W. J. Holland.

Catalogue of the species of Coleoptera common to Northern America, Northern Europe and Northern Asia, with bibliography, by John Hamilton, M. D.

Synopsis of the Halticini of Boreal America, by G. H. Horn, M. D.

Report accepted and publication ordered.

Donations to cabinet of American Entomological Society were announced as follows: five Lepidoptera from Dr. Skinner; four species of Dragon-flies not among those previously presented, from Mr. Calvert.

Mr. Wenzel exhibited a fine series of fifteen species of Carabidæ taken at Five-mile Beach, N. J.

Dr. Horn gave some details of his studies of Heterocerus, referring especially to the form of mandibles of one of them and to the prolongation of the labrum in others. The variations of markings were illustrated showing their evident derivation from a common type.

Mr. Calvert exhibited some Dragon-flies from Japan, one pair of *Cordulegaster Sieboldii* Selys having greater measurement than had been previously recorded.

A communication from the Secretary of the Academy was taken up, and on motion the first Thursday night of each alternate month was chosen to bring forward Entomological communications.

On the report of the Executive Committee Mr. Aaron moved that the Curators of the Academy be advised that the T. R. Peale collection had been accepted to be incorporated with the main collection of the Academy, and that the thanks of the Academy be tendered to the heirs of Mr. Peale for their valuable donation.

It was further ordered that suitable labels be prepared to indicate the Peale specimens.

May 23, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. v, No. 5. From the Editor.

Canadian Entomologist, May, 1889. From the Editor.

Proceedings of the Entomological Society of Washington, D. C., vol. i, No. 3. From the Society.

Entomologist's Monthly Magazine, May, 1889. From the Conductors.

Insect Life, vol. i, Nos. 9–10. From U. S. Dept. of Agriculture.

Biologia Centrali-Americana: Coleoptera, vol. ii, pt. 2, pp. 337–376, pl. 19–23; iii, pt. 1, pp. 65–104, pl. 21; iv, pt. 2, pp. 1–32; pt. 3, pp. 1–24, pl. 1; vi, pt. 1. Suppl. pp. 89–104; vii, pp. 121–128. Hymenoptera, vol. ii, pp. 49–64, pl. 3–4. By purchase

Catalogue of Diurnal Lepidoptera, described by Fabricius, in the collection of the British Museum, by A. G. Butler. By purchase.

On the British Species of Allotrinæ, with descriptions of other new species of Parasitic Cynipidæ, by P. Cameron. By the Author.

Prodromus of the Zoology of Victoria, by F. McCoy; decade 17. From the Author.

The Executive Committee reported continued progress of work on collections and library.

Dr. Skinner presented for the collection of the American Entomological Society a specimen of *Aeschna verticalis* Hag.

A pair each of *Melitæa McGlashani* and *Neonympha Mitchelli* obtained in exchange for the cabinet of American Entomological Society were exhibited.

A communication was read from the Secretary of the Academy indicating that the evening selected for the Entomological communications was unsuitable, whereupon it was voted that the second Tuesday of each alternate month be selected as suggested.

Mr. Bland exhibited specimens of *Onthophagus nuchicornis* recently collected near Camden, on the line of the Philadelphia and Atlantic City Railroad. In many years collecting the insect had never before been captured.

Dr. Horn stated that this is the second locality of its occurrence recorded on this side of the Atlantic, the species being European, and doubtless introduced with ballast refuse.

Dr. Skinner stated that in 1862 Mr. Geo. Newman had reported the capture of *Anthrocharis genutia*, since which time none had been observed until recently, when specimens were taken near Timber Creek, where Newman had probably taken it. Mr. Seeber had also taken the same insect there.

Dr. Horn exhibited a series of the species of the entire tribe Halticini, a synopsis of which is now being published in the TRANSACTIONS. He also exhibited a series of drawings of the species of *Heterocerus* at present known to him.

Dr. Skinner exhibited specimens of *Platysamia ceanothi* from California showing similar sexual peculiarities as had recently been mentioned in Cecropia.

The Director announced that the next meeting of the Section would be held June 10th, after the meeting of the American Entomological Society.

JUNE 10, 1889.

Director Dr. HORN in the chair.

The following additions to the Library of the American Entomological Society were announced:

Canadian Entomologist, vol. xxi, No. 6. From the Editor.

Insect Life, vol. i, No. 11. From the U. S. Dept. of Agriculture.

Report of the Entomologist, C. V. Riley, for 1888. From the Author.

Proceedings of the Zoological Society of London, 1888. From the Society.

The Lepidoptera of Ceylon, 3 vols. by F. Moore. By purchase.

Bulletin de la Société Imperiale des Naturalistes de Moscou, 1888, No. 3. From the Society.

Compte-rendu Société Entomologique Belgique, sér. iii, No. 112. From the Society.

Species des Hyménoptères d'Europe et d'Algerie, par Ed. André, part 34. From the Author.

National Academy of Sciences, vol. iv, First Memoir. From the Society.

The Executive Committee reported satifactory progress in the work on cabinet and library.

The Publication Committee announced the completion of about 200 pages of the TRANSACTIONS.

Dr. Horn spoke of several instances in which it was stated that insects had been passed from the human body through the usual excretory channels, or from pustules or abscesses on the surface. The latest occurrence was that of *Lathridius minutus*, said to have been removed from small pustules. A careful investigation proved that this was merely an instance of an attempted deception of the physician by an hysterical patient. Another case was that of a noctuid moth said to have come from a superficial abdominal abscess. Both patients were women.

J. B. Smith mentioned several instances within his knowledge which seemed to lack all the characteristics of truthful statements. He also placed many of the so-called injuries from spider bites in the same category.

Dr. McCook continued with other instances.

Mr. Smith also called attention to the stridulation in *Crioceris asparagi* not as a new fact, as the same had been observed in Europe whence the species has been introduced.

Dr. Horn stated that stridulating Chrysomelidæ are not numerous. In reverting to the already published fact that *Harpalus caliginosus* stridulates quite loudly, he stated that *H. pennsylvanicus*, *compar* and their allies had similar powers as had been mentioned to him by Dr. Hamilton.

On motion of Mr. Aaron it was ordered that the committee appointed by the American Entomological Society to obtain a room in the Park for the better study of the life-histories of insects be empowered to act for this Section.

The Section adjourned until September.

September 26, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. v, Nos. 6–9. From the Society.

Canadian Entomologist, vol. xx, Nos. 7–9. From the Editor.

Proceedings of the Academy of Natural Sciences of Philadelphia, 1889, Part 1. From the Academy.

Proceedings of the California Academy of Sciences, vols. v, vi, vii; 2d sér. vol. i, Parts 1–2; Bulletin, Nos. 1–8. From the Academy.

Proceedings of the Davenport Academy of Natural Sciences, vol. iii, No. 1; iv, and v, No. 1. From the Academy.

Transactions of the American Entomological Society, vol. xvi, No. 3. From the Publication Committee.

Journal of the Trenton Natural History Society, vol. ii, No. 1. From the Society.

Nineteenth annual report of the Entomological Society of Ontario, 1889. From the Society.

Bulletin of the Museum of Comparative Zoology, vol. xvi, No. 5. From the Museum.

Psyche, vol. v, Nos. 157–159. From the Editors.

Michigan Agricultural Experiment Station, Bulletin No. 7, April, 1889. From Prof. A. J. Cook.

Minnesota Agricultural Experiment Station, Bulletin Nos. 50 and 51, June and July, 1889. From O. Lugger.

Insect Life, vol. i, No. 12; ii, Nos. 1–2. From U. S. Dept. of Agriculture.

Entomologist's Monthly Magazine, June to September, 1889. From the Conductors.

Proceedings of the Zoological Society of London, 1889, Parts 1–2. From the Society.

Journal of the Linnean Society of London, vol. xx, Nos. 119–121: xxi, No. 132; xxii, No. 140. From the Society.

Journal and Proceedings of the Royal Society of New South Wales, vol. xxii, Part 2, 1888. From the Society.

Le Naturaliste Canadien, vol. xix, No. 1, July, 1889. From the Editor.

Annales de la Société Entomologique de Belgique, vol. xxxii, 1888. From the Society.

Compte-Rendu, 1889, sér. iii, No. 113. From the Society.

Bulletino della Societa Entomologica Italiana, vol. xx, 1888. From the Society.

Verhandlungen der naturhistorischen Vereines der preussischen Rheinland, vol. 45, No. 5. From the Society.

Verhandlungen der k.-k. Zoologisch-botanischen Gesellschaft in Wien, vol. xxxix, Parts 1–2, 1889. From the Society.

Mittheilungen der Schweizerischen Entomologischen Gesellschaft, vol. viii, No. 3, 1889. From the Society.

Deutscher Entomologische Zeitschrift. Heft i, 1889. From the Society.

Butterflies of North America, by W. H. Edwards, sér. iii, Part 8. From the Author.

Second Supplement to the List of Coleoptera of America North of Mexico, by Samuel Henshaw. From the Author.

Hymenoptera Orientalis, or contributions to a knowledge of the Hymenoptera of the Oriental Zoological Region, by P. Cameron. From the Author.

Biologia Centrali-Americana. Coleoptera, vol. iii, pt. i, pp. 105–112, pl. 5; iv, pt. 2, pp. 33–72, pls. 1–3; pt. 3, pp. 25–40; vi, pt. 1. Suppl. pp. 105–129, pl. 37. Heteroptera, vol. i, pp. 257–272. By purchase.

Memoires sur les Lépidoptères, vol. v, par M. Romanoff. By purchase.

Materiaux pour la Faune Entomologique de Hainant Coléoptères Quatrième Centurie.—Consiels pour l'etude des Palpicornes Aquatiques.—Materiaux pour la Faune Entomologique de la Province de Namur. Coléoptères Troiseme Centurie.—Repertoire Alphabetique des noms specifiques admis ou proposes dans la Sous-Famille des Libellulines, par A. Preudhomme de Borre. From the Author.

The Executive Committee reported progress of work on collections and library.

Mr. Aaron, from the special committee, reported that the rooms in the English building in the Park would be placed at the disposal of the Section. Members would also be permitted to have rearing boxes in the Horticultural building for short periods.

The following donations to the cabinet of the American Entomological Society were announced:

Pamphila ursa and several small Neuroptera from Mr. Calvert.

Written communications 228–229–230 were read by title and referred to the Publication Committee.

Dr. Horn announced that the TRANSACTIONS to page 350 had been completed, with seven plates, to which the Proceedings would add probably thirty pages.

Prof. J. B. Smith stated that while at Anglesea, on the sea-coast, he noticed a series of contests. First there were enormous swarms of mosquitos, soon after large numbers of Dragon-flies appeared and fed rapaciously on the mosquitos. Later in the afternoon flocks of sea-gulls appeared, in their turn devouring the Dragon-flies; the battle continued until dark, when the gulls and Dragon-flies disappeared, leaving the mosquitos apparently none the less numerous. He observed that mosquitos lived abundantly in the woods as well as in the clear and open spaces, by which means they escaped the Dragon-flies, who avoided the forests.

Dr. Horn spoke of the genera allied to Philydrus, and illustrated especially the forms of claws in the male.

Mr. Westcott recorded the capture of *Pamphila viator* at Woodland Beach, also *P. Delaware* at Manayunk, the latter being a very rare occurrence so far north.

Mr. Aaron reported that *Pamphila fusca* had become abundant near the city by the introduction of its food plant from the South.

Mr. Wells reported the capture of *Catocala rector* at Cresson, Pa.

October 24, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Canadian Entomologist, vol. xxi, No. 10. From the Editor.

Entomologist's Monthly Magazine, vol. xxv, No. 5. From the Conductors.

Insect Life, vol. ii, No. 3. From the U. S. Dept. of Agriculture.

Le Naturaliste Canadien, vol. xix, No. 3, September, 1889. From the Editor.

Berliner Entomologische Zeitschrift, vol. xxxiii, No. 1. From the Society.

Compte-Rendu, sér. iii, No. 116. From the Society.

The Executive Committee reported progress of work.

The Publication Committee reported in favor of publishing the following papers:

The species of Heterocerus of Boreal America by Geo. H. Horn, M. D.

Notes on the species of Ochthebius of Boreal America by Geo. H. Horn, M. D.

Notes on the species of Dendroctonus of Boreal America by W. G. Dietz, M. D.

Reported accepted and publication ordered.

Written communication 231 was read by title and referred to Publication Committee.

Mr. Calvert spoke of the migration of Dragon-flies. He recorded the occurrence of forty-six species about Philadelphia, forty being in his cabinet, the remainder in that of the Society. He also recorded *Mesothemis corrupta* as an addition to the local fauna.

Mr. Aaron spoke of an observation made recently which seemed to indicate a migration of *Anax Junius*, and more recently of *Danais Archippus*.

Dr. Horn spoke of the species of Hydrobius and the characters which must be used in the separation of species.

Mr. Aaron, referring to his progress in a bibliographical catalogue of our Lepidoptera, asked as to the desirability of including the semi-tropical forms which occurred in southern Florida. The debate which followed indicated that those species should be included, which had established themselves in the vicinity.

Mr. Aaron moved that beginning with January the Section publish monthly its Proceedings, together with such short papers as might be presented, and in order that the desirability of such action be ascertained that it be referred to the Publication Committees of the Section and American Entomological Society for consideration and report. Adopted.

November 28, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Proceedings of the Boston Society of Natural History, vol. xxiv, Nos. 1–2. From the Society.

Canadian Entomologist, vol. xxi, No. 11. From the Editor.

Proceedings of the Zoological Society of London, 1889, Part 3. From the Society.

Bulletin No. 6 of the Hatch Experiment Station of the Massachusetts Agricultural College. From the College.

Bulletin No. 20 United States Department of Agriculture, Division of Entomology, 1889. From the Department.

Insect Life, vol. ii, No. 4. From the U. S. Dept. of Agriculture.

Entomologist's Monthly Magazine, November, 1889. From the Conductors.

Annales de la Société Entomologique de France, sér. 6, vol. viii, 1888. From the Society.

Le Naturaliste Canadien, vol. xix, No. 4, October, 1889. From the Editor.

Verhandlungen der k.-k. Zool.-botanischen Gesellschaft in Wien, vol. xxxix, No. 3, 1889. From the Society.

Verhandlungen der naturhistorischen Vereines der preussischen Rheinland, vol. 46, No. 1. From the Society.

On two collections of Heterocerous Lepidoptera from New Zealand, with descriptions of new species. From Dr. Skinner.

Quadraginta Coleoptera Nova Argentina, by Carlo Berg. From E. M. Aaron.

Biologia Centrali-Americana. Coleoptera, vol. ii, pt. 1, pp. 265–304, pl. 8–9; pt. 2, pp. 377–384; iii, pt. 1, pp. 113–144, pl. 6; iv, pt. 2, pp. 73–104, pl. 4; vi, pt. 1, Suppl. pp. 121–152, pl. 38. Lepidoptera-Rhopalocera, vol. ii, pp. 113–152, pl. 59–62; Heterocera, vol. i, pp. 273–320, pl. 26–29. Rhynchota, pp. 305–320, pl. 29. Arachnida-Araneidea, pp. 1–40, pl. 1–3. By purchase.

The joint committee made the following report:

The joint committee on Publication of the Entomological Section Academy of Natural Sciences and the American Entomological Society, to whom was referred the matter of the publication of the Proceedings of the meetings of the Section monthly in a separate form respectfully report: that they have duly considered the subject and are of the opinion that such a publication if properly, wisely and economically managed, could be maintained, and be a useful and valuable adjunct both to Section and Society.

They would suggest that at least sixteen pages be published monthly, in ten numbers, omitting July and August, of uniform size, with the Transactions of the Society and with the title "Entomological News and Proceedings of the Entomological Section of the Academy of Natural Sciences." The subscription price to be one dollar per annum, but free to the members and associates of the Section.

The expense of publication to be defrayed by the receipts from subscription and advertisements, together with such sum as the Section may be able to appropriate from its funds, and in case of deficit a sum not exceeding one hundred dollars to be appropriated from the funds of the American Entomological Society. The new publication to be under the management of the joint Publication Committees of the Section and Society, who shall elect an editor and an advisory committee of four persons to conduct the publication, subject to such rules as the joint committee may establish, the committee to make a report to the Section at least four times each year. In order to obtain for the library of the Society certain publications for which it is not desirable to exchange the TRANSACTIONS, it is proposed that the Publication Committee of the Society subscribe for at least fifty copies for the above-named purpose.

E. T. CRESSON,
C. A. BLAKE,
BENJAMIN H. SMITH, } For the Society.

HENRY SKINNER,
PHILIP LAURENT, } For the Section.

On motion the report was received and the recommendations adopted.

The Publication Committee reported in favor of publishing the following paper:

Descriptions of some new species of Agrotis by John B. Smith.

Report accepted and publication ordered.

One pair of *Seiarctica echo* was presented by Mrs. A. T. Slosson through Dr. Skinner.

Papers 232–233 were read by title and referred to Publication Committee.

Dr. Skinner stated that while at Cape May he had observed a Pamphila with peculiar flight, but was unable to capture it. Later seven specimens were taken. It seems to be a new species resembling *P. viator* and *P. Delaware*. Its flight is very swift.

Dr. Horn announced his intention of continuing his study of Hydrophilidæ by including the species of Cercyon and allied genera. There are in his collection about eighteen species of Cercyon, four of which are peculiar to the west coast. The eastern forms are nearly all identical with those of Europe.

Dr. Horn stated that the paper recently published by Dr. Hamilton on the sub-polar distribution of Coleoptera, had been received with great interest by European students, and the discussion resulting would doubtless clear up many disputed points in synonymy.

The Director announced that the next meeting of the Section would be held after that of the American Entomological Society on December 9th.

December 9, 1889.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Proceedings of the Academy of Natural Sciences of Philadelphia, 1889, Part 2. From the Academy.

Insect Life, vol. iii, No. 3. From the U. S. Dept. of Agriculture.

Bulletin No. 6 Hatch Experiment Station of the Massachusetts Agricultural College, October, 1889. From the College.

Bulletin No. 3, Experiment Station Kansas State Agricultural College, June, 1888. From Dr. H. Skinner.

Bulletin No. 9, Agricultural Experiment Station, University of Minnesota, November, 1889. From the University.

Le Naturaliste Canadien, vol. xix, No. 5, November, 1889. From the Editor.

Le Naturaliste Revue-illustrée des Sciences Naturalles, 2d sér. Nos. 8, 19, 21, 33, 36. From the Publisher.

Notes on the species of Lachnosterna of Temperate North America, with descriptions of new species, by John B. Smith. From the Author.

The Root-knot disease of the Peach, Orange and other plants in Florida, due to the work of Anguillula, by J. C. Neal, M. D.

Exotische Schmetterlinge, von Dr. O. Staudinger und Dr E. Schatz, vol. ii, Part 5. By purchase.

The report of the Treasurer was read and referred to a committee, for report, to consist of Mr. Knight, Dr. Lewis and Mr. McAllister.

Mr. Cresson reported the action of the joint committee of the Section and Society, announcing their action in the organization of the advisory committee to conduct the new publication. Mr. E. M. Aaron was chosen editor, and Dr. Horn, Mr. Cresson and Dr. Skinner were chosen advisory committee, Mr. Cresson being treasurer.

The committee asked permission of the Section to add the name of Philip P. Calvert, an associate member, to the advisory committee.

On vote the request was granted.

The Publication Committee reported in favor of publishing papers entitled "Notes on some North American Odonata, with descriptions of three new species," by Philip P. Calvert; also

"Contributions towards a monograph of the Noctuidæ of Temperate North America—Revision of the species of Oncocnemis," by John B. Smith.

Report accepted and publication ordered.

Donations to cabinet of American Entomological Society were exhibited as follows: *Sphinx lugens*, *Spilosoma congrua*, *Cerathosia tricolor* and *Grapta umbrosa*, from Dr. Skinner, all new to cabinet.

Five species of Indian and three North American Coleoptera from F. M. Jones, Wilmington, Del.

Pamphilus Ethlius from Mr. Calvert, collected near Philadelphia.

The committee on nominations reported a list, whereupon an election was held and the following chosen for the year 1890:

Director.—G. H. Horn, M. D.

Vice-Director.—H. C. McCook, D. D.

Treasurer.—E. T. Cresson.

Recorder.—E. M. Aaron.

Publication Committee.—B. H. Smith, Philip Laurent.

Mr. Smith declined, from the fact that he was on the same committee of the American Entomological Society, when Mr. J. H. Ridings was chosen to the vacancy.

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The names of new genera and of new species are followed by the name of the Author.

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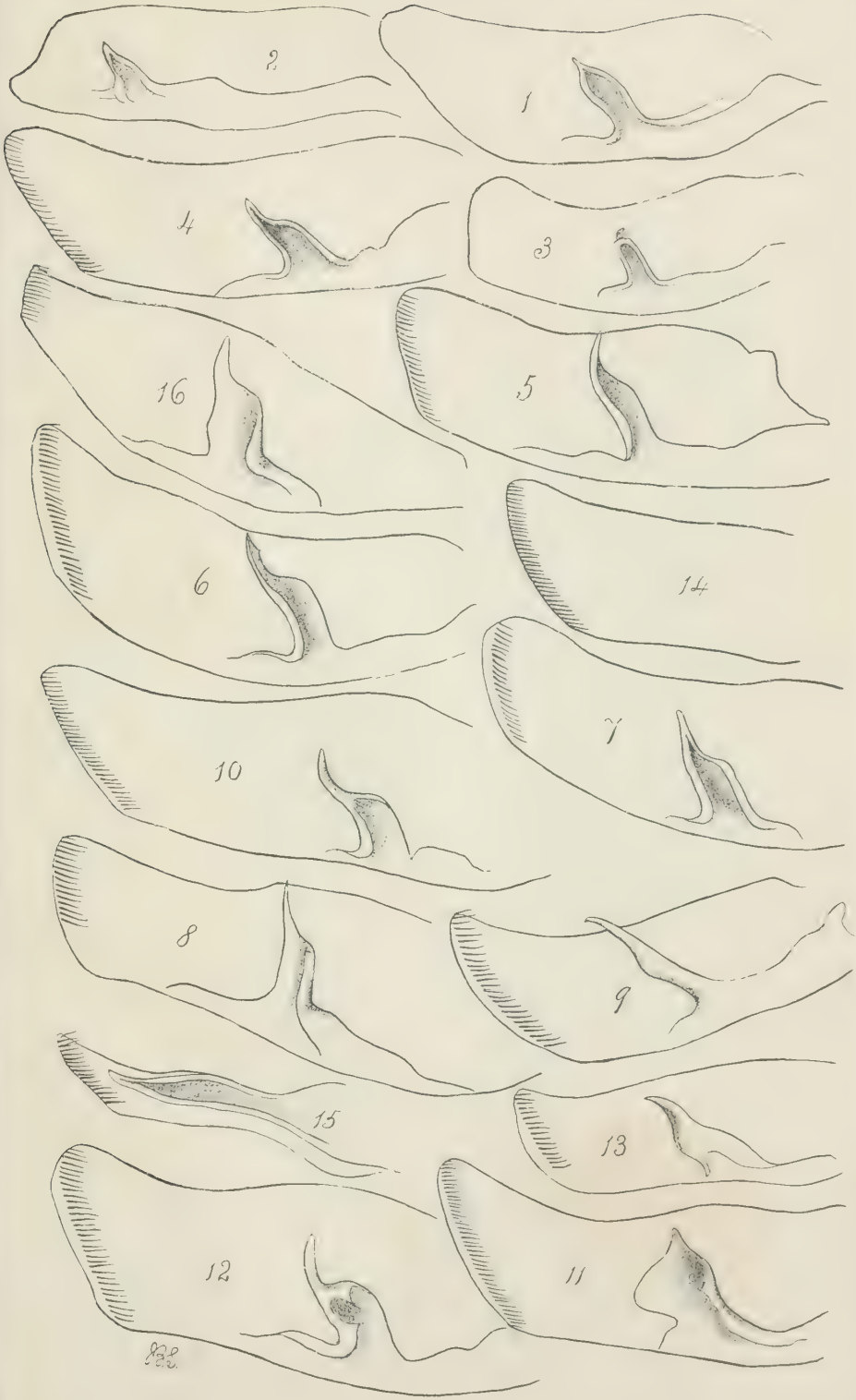
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